DOCUMENT RESUME

ED 141 944 EA 009 757

TITLE Emergency Assistance for Schools Act. Hearing before the Subcommittee on Elementary, Secondary and Vocational Education of the Committee on Education and Labor. House of Representatives, Ninety-fifth Congress, First Session on H.R. 5996.

INSTITUTION Congress of the U.S., Washington, D.C. House Committee on Education and Labor.

PUB DATE 77

NOTE 240p.; Not available in paper copy due to small type size of original document; Pages 71-76 and 190-196 may be illegible; For related documents, see EA 009 579-580

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.

DESCRIPTORS *Educational Finance; *Educational Legislation; Elementary Secondary Education; Energy; Energy Conservation; *Federal Aid; Federal Government; *Federal Legislation; *Fuel Consumption; *Operating Expenses

IDENTIFIERS *Emergency Assistance for Schools Act

ABSTRACT

This publication is a comprehensive record of testimony and exhibits presented to the Subcommittee on Elementary, Secondary, and Vocational Education of the U.S. House of Representatives during a hearing on H.R. 5996, a bill to provide emergency federal aid to local educational agencies in order to meet the rapidly increasing cost of fuel. Included are the testimony and exhibits of 20 individuals, including an architect, a mechanical contractor, a professional engineer, representatives of various educational organizations, and representatives from the U.S. Commerce Department, the Federal Energy Administration, and Energy Research and Development Administration. The complete text of the bill is also included. (JG)

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EMERGENCY ASSISTANCE FOR SCHOOLS ACT

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HEARING

BEFORE THE

SUBCOMMITTEE ON ELEMENTARY, SECONDARY AND VOCATIONAL EDUCATION

OF THE

COMMITTEE ON EDUCATION AND LABOR
HOUSE OF REPRESENTATIVES

NINETY-FIFTH CONGRESS

FIRST SESSION

ON

H.R. 5996

TO AMEND THE ELEMENTARY AND SECONDARY EDUCATION ACT OF 1965 TO PROVIDE FEDERAL FINANCIAL ASSISTANCE TO LOCAL EDUCATIONAL AGENCIES IN ORDER TO ASSIST THEM IN MEETING THE EMERGENCY CAUSED BY THE HIGH COSTS OF FUEL AND FUEL SHORTAGES AND ADVERSE WEATHER CONDITIONS, AND FOR OTHER PURPOSES

HEARING HELD IN WASHINGTON, D.C.
MAY 3, 1977

Printed for the use of the Committee on Education and Labor
CARL D. PERKINS, *Chairman*

U.S. GOVERNMENT PRINTING OFFICE
90-490 O WASHINGTON : 1977

EA 009 757

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EMERGENCY ASSISTANCE FOR SCHOOLS ACT

TUESDAY, MAY 3, 1977

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ELEMENTARY, SECONDARY,
AND VOCATIONAL EDUCATION,
COMMITTEE ON EDUCATION AND LABOR,
Washington, D.C.

The subcommittee met, pursuant to notice, at 9:40 a.m., in room 2175, Rayburn House Office Building, Hon. Carl D. Perkins, Chairman of the subcommittee, presiding.

Members present: Representatives Perkins, Le Fante, and Weiss.

Staff present: John F. Jennings, majority counsel; Nancy L. Kober, staff assistant; Christopher Cross, minority senior education consultant.

Chairman PERKINS. The Subcommittee on Elementary, Secondary, and Vocational Education is conducting a hearing today on H.R. 5996, the Emergency Assistance for Schools Act.

I introduced this bill on behalf of the American Association of School Administrators, which I am pleased to have represented here today. The basic purpose of the legislation is to assist our educational institutions, especially our elementary and secondary schools, in meeting the budgetary crisis they are presently facing due to rapidly increasing costs of fuel.

The bill authorizes $500 million per year through fiscal year 1981, and funds can be used to make school facilities more energy efficient, for demonstration grants for projects that show great promise of improving energy conservation in the schools, and for technical assistance.

I would like to commend the AASA for showing such leadership in urging Congress to help meet this crisis. They have studied the situation and have made some very sound recommendations for action in this area. I would like to welcome representatives of the AASA here today, especially Dr. Shirley Hansen, special legislative assistant, who has devoted such a great deal of effort to these energy problems.

I would also like to commend Senator Claiborne Pell, the Chairman of the Senate Subcommittee on Education, for being among the first to recognize the scope of this problem and for introducing S. 701, which would provide Federal assistance in this area. Senator Pell is, in my opinion, one of the outstanding leaders in education,

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and the bill he has introduced confirms this leadership role. My bill is basically a companion bill to Senator Pell's.

With this hearing today, I hope we can document the facts about the seriousness of the crisis schools are facing and also address the question of what can be done to alleviate it. In addition to various educational organizations, we will be hearing from expert witnesses on energy conservation from the Commerce Department, ERDA, and the Federal Energy Administration. We will also be hearing from an architect, mechanical contractor, and a professional engineer who are familiar with alternative ways for making buildings more energy efficient.

It is my hope that a program of assistance to elementary and secondary schools such as the one proposed in H.R. 5996 will become part of the Administration's comprehensive energy plan, either as a section of other energy legislation or through separate legislation such as H.R. 5996. I am sure that our hearing today will establish the need for such legislation.

[Text of H.R. 5996 follows:]

95TH CONGRESS
1ST SESSION

H. R. 5996

IN THE HOUSE OF REPRESENTATIVES

APRIL 4, 1977

Mr. PERKINS introduced the following bill; which was referred to the Committee on Education and Labor

A BILL

To amend the Elementary and Secondary Education Act of 1965 to provide Federal financial assistance to local educational agencies in order to assist them in meeting the emergency caused by the high costs of fuel and fuel shortages and adverse weather conditions, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Elementary and Secondary Education Act of 1965 is amended by adding at the end thereof the following new title:

I

"TITLE X—EMERGENCY ASSISTANCE FOR SCHOOLS

"STATEMENT OF FINDINGS

"SEC. 1001. (a) The Congress finds that—

"(1) local educational agencies throughout the Nation need emergency assistance to continue delivering educational services to students in the face of the increased costs of operating school facilities;

"(2) the maintenance and operation of elementary and secondary school facilities is extraordinarily costly and the proportion of expenditures used for physical plant has increased faster than that of any other educational expenditure;

"(3) many older school facilities can be remodeled or renovated so that the cost of their operation can be reduced; and

"(4) the emergency now facing many States, localities, and educational institutions, due to the continuing rise in fixed expenses, threatens the quality of education throughout the Nation.

"(b) It is the purpose of this title (1) to make basic grants to local educational agencies to enable them to undertake measures to make school facilities more efficient to operate, (2) to make demonstration grants to State agencies and educational institutions for projects which show great promise

of meeting the needs described in subsection (a) of this section and (3) to provide technical assistance to such agencies and institutions.

"BASIC GRANTS AUTHORIZED

"SEC. 1002. (a) The Commissioner shall, in accordance with the provisions of this Act, make basic grants to local educational agencies to pay the Federal share of the costs related to energy conservation measures undertaken by any such institution, including the cost of modifying the school building to significantly improve energy efficiency.

"(b) For the purpose of making grants under subsection (a), there is authorized to be appropriated $350,000,000 for the fiscal year 1978 and for each of the succeeding fiscal years ending prior to October 1, 1981.

"ALLOTMENTS FOR BASIC GRANTS

"SEC. 1003. (a) (1) From the sums appropriated pursuant to section 1002 (b), the Commissioner shall allot not more than 1 per centum among Guam, American Samoa, the Virgin Islands, and the Trust Territory of the Pacific Islands according to their respective needs.

"(2) From 50 per centum of the remainder of such sums the Commissioner shall provide an equitable distribution of financial assistance among the States.

"(3) The remainder of the sums appropriated under section 1002 (b) shall be available to the Commissioner for

making basic grants under this title based primarily on energy conserving potential, local educational agency energy hardships, or as an incentive for schools to replace scarce fuel sources with more abundant fuels.

"USES OF BASIC GRANTS

"SEC. 1004. Payments made for basic grants under this title to any local educational agency may be used in accordance with applications of that agency approved under section 1005(b) for the Federal share of the costs related to energy conservation measures undertaken by that agency, including the costs of insulation, remodeling, renovation, and other energy saving modifications of its school facilities.

"APPLICATIONS

"SEC. 1005. (a) Payments may be made for basic grants under this title only upon application to the Commissioner at such time, in such manner, and containing or accompanied by such information as the Commissioner may reasonably require. Each such application shall—

"(1) provide assurances that because of—

"(A) the high cost of energy,

"(B) energy shortage, or

"(C) unusually harsh and persistent adverse weather conditions, the applicant is in need of assistance;

"(2) provide a full description of the energy con-

servation measures to be taken by the agency and assurances that payments made under this title for basic grants will be used for the purposes set forth in section 1004;

"(3) set forth policies and procedures to assure the Federal funds made available for basic grants under this title for any fiscal year will be used so as not to supplant the level of State and local funds that would otherwise be available for the purposes described in section 1004;

"(4) provide that effective procedures will be adopted for evaluating the effectiveness of the assistance given for basic grants under this title;

"(5) provide that fiscal control and fund accounting procedures will be established as may be necessary to insure the proper disposal of, and accounting for Federal funds paid to the agency under this title; and

"(6) provide that reports will be furnished in such form and containing such information as the Commissioner may reasonably require and such records will be kept and access furnished thereto as the Commissioner may find necessary to assure the correctness and verification of such reports.

"(b) Applications for financial assistance for basic grants under this title may be approved by the Commissioner only if—

"(1) the application meets the requirements set forth in subsection (a); and

"(2) the application has been submitted to the appropriate State agency for comment before being submitted to the Commissioner.

"(c) Amendments of an application shall, except as the Commissioner may otherwise provide, be subject to approval in the same manner as the original application.

"DEMONSTRATION PROJECTS

"SEC. 1006. (a) The Commissioner is authorized to make grants to local educational agencies or State educational agencies, State energy offices, other appropriate State agencies, and institutions of higher education to work in conjunction with local education agencies for demonstration projects which involve the development and use of energy conservation measures which show unusual promise of promoting the objectives of this title.

"(b) To the extent practicable the Commissioner shall approve applications for payments under this section in such manner as will most nearly provide an equitable distribution of financial assistance among the States.

"(c) No payment may be made under this section unless the Commissioner determines that the payment is to be used for a project for which assistance is necessary be-

cause of the high cost of energy, the shortage of energy, or unusually harsh and persistent adverse weather conditions.

"(d) No payment may be made under this section unless an application is submitted to the Commissioner at such time, in such manner, and containing or accompanied by such information as the Commissioner may reasonably require. Each such application shall include provisions that—

"(1) assure that the project will be economically feasible;

"(2) set forth the rate of return based upon the energy management component of the project compared with the rate of return based upon the remodeling or renovation component of the project; and

"(3) describe whether it is feasible to use the results of the project in other communities.

"(e) There are authorized to be appropriated to carry out the provisions of this section $30,000,000 for the fiscal year 1978 and for each of the succeeding fiscal years ending prior to October 1, 1981.

"TECHNICAL ASSISTANCE

"SEC. 1007. (a) The Commissioner is authorized to make grants to local educational agencies or State educational agencies, State energy offices, other appropriate State agencies, and institutions of higher education in conjunction

with local educational agencies to pay the Federal share of the cost of providing technical assistance for energy conservation measures.

"(b) Such technical assistance may include—

"(1) the temporary employment of specially qualified personnel necessary for—

"(A) the planning and implementation of energy conservation or energy management projects including energy use and evaluations, and

"(B) the planning and development of remodeling, renovation, repair, replacement, or insulation projects;

"(2) the conduct of specialized studies on the implementation of building management or maintenance projects;

"(3) the conduct of feasibility studies on energy management and energy remodeling or renovation projects; and

"(4) the conduct of energy use evaluations.

"(c) No payment may be made under this section unless the Commissioner determines that the payment is to be used for technical assistance which is necessary because of the high cost of energy, the shortage of energy, or unusually harsh and persistent adverse weather conditions.

"(d) No payment may be made under this section

unless an application is submitted to the Commissioner at such time, in such manner, and containing or accompanied by such information as the Commissioner may reasonably require. Each such application, in the case of a local educational agency, shall contain provisions designed to assure that the technical assistance for which assistance is sought will, to the greatest extent practicable, be shared with private elementary and secondary schools in the school district of such agency.

"(e) There are authorized to be appropriated to carry out the provisions of this section $120,000,000 for the fiscal year 1978 and for each of the succeeding fiscal years ending prior to October 1, 1981.

"PAYMENTS

"SEC. 1008. (a) (1) From the amount allotted under section 1003(a) the Commissioner shall pay to each local educational agency having an application approved under section 1005(b), an amount equal to the Federal share of the cost of carrying out the application of such agency.

"(2) The Federal share of the cost of carrying out the application of an agency for basic grants under section 1005 shall be 50 per centum for any fiscal year.

"(b) (1) From the amounts appropriated pursuant to section 1006(e) the Commissioner shall pay to the local educational agency or the agency, office, or institution and

local educational agency having an application approved under section 1006(d) the Federal share of the cost of carrying out its application.

"(2) The Federal share of the cost of carrying out the application of an agency or an agency and an office or institution for demonstration grants under section 1006 shall be 66⅔ per centum in any fiscal year.

"(c) (1) From the amount appropriated pursuant to section 1007(e) the Commissioner shall pay to any local educational agency or the agency, office, or institution and local educational agency having an application approved under section 1007(d) an amount equal to the Federal share of the cost of carrying out its application.

"(2) The Federal share of the cost of carrying out the application of an agency or an agency and an office or institution for technical assistance under section 1007 shall be 50 per centum for any fiscal year.

"(d) Whenever the Commissioner determines that a local educational agency with an approved application for a basic grant under section 1005(b) or a local educational agency with an approved application for technical assistance under section 1007 is suffering from extreme financial need and cannot, because of the limitation of Federal financial assistance to 50 per centum of the cost of the approved application, carry out the project described in that applica-

tion the Commissioner may waive such limitation and may pay the full cost of carrying out the approved application.

"WITHHOLDING

"SEC. 1009. Whenever the Commissioner, after reasonable notice and opportunity for hearing to any local educational agency or a State educational agency or office, or institution with a local educational agency receiving assistance under this title, finds that there has been a failure to comply substantially with the provisions set forth in the application approved under section 1005(b) or section 1006(d) or section 1007(d), the Commissioner shall notify the agency, office, or institution that further payments will not be made to the agency, office, or institution under this title until he is satisfied that there is no longer any such failure to comply. Until he is so satisfied no further payments shall be made to the agency, office, or institution under this title.

"ADMINISTRATION

"SEC. 1010. (a) Nothing contained in this title shall be construed to authorize the making of any payment under this title for religious worship or instruction.

"(b) Prior to the promulgation of any regulations under this title for the submission and approval of applications, the Commissioner shall consult with mechanical contractors, professional engineers, business officials of elementary and secondary schools and institutions of higher education, officials

having responsibility for energy conservation and energy use in such schools and institutions, and officials of the Federal Energy Administration and the Energy Research and Development Administration.

"(c) In administering the provisions of this title the Commissioner is authorized to use the services and facilities of any agency of the Federal Government and any other public or nonprofit agency or institution in accordance with appropriate agreements and to pay for such services either in advance or by way of reimbursement as agreed upon.

"(d) In administering the provisions of this title the Commissioner is authorized to use no more than 1 per centum of the funds appropriated for purposes of this title for any fiscal year.

"DEFINITIONS

"SEC. 1011. As used in this title:

"(1) The term 'Commissioner' means the Commissioner of Education.

"(2) The term 'elementary school' means a day or residential school which provides elementary education, as determined under State law.

"(3) The term 'institution of higher education' means an educational institution in any State which (A) admits as regular students only persons having a certificate of graduation from a school providing second-

ary education, or the recognized equivalent of such a certificate, (B) is legally authorized within such State to provide a program of education beyond secondary education, (C) provides an educational program for which it awards a bachelor's degree or provides not less than a two-year program which is acceptable for full credit toward such a degree, (D) is a public or other nonprofit institution, and (E) is accredited by a nationally recognized accrediting agency or association or, if not so accredited, (i) is an institution with respect to which the Commissioner has determined that there is satisfactory assurance, considering the resources available to the institution, the period of time, if any, during which it has operated, the effort it is making to meet accreditation standards, and the purpose for which this determination is being made, that the institution will meet the accreditation standards of such an agency or association within a reasonable time, or (ii) is an institution whose credits are accepted, on transfer, by not less than three institutions which are so accredited, for credit on the same basis as if transferred from an institution so accredited. Such term also includes any school which provides not less than a one-year program of training to prepare students for gainful employment in a recognized occupation and which meets the provision of clauses

(A), (B), (D), and (E). For purposes of this paragraph, the Commissioner shall publish a list of nationally recognized accrediting agencies or associations which he determines to be reliable authority as to the quality of training offered.

"(4) The term 'local educational agency' means a public board of education or other public authority legally constituted within a State for either administrative control or direction of, or to perform a service function for, public elementary or secondary schools of a city, county, township, school district, or other political subdivision of a State, or such combination of school districts or counties as recognized in a State as an administrative agency for its public elementary or secondary schools. Such term also includes any other public institution or agency having administrative control and direction of a public elementary or secondary school.

"(5) The term 'secondary school' means a day or residential school which provides secondary education, as determined under State law.

"(6) The term 'school facilities' includes classrooms and related facilities of an elementary school, secondary school, or an institution of higher education, and initial equipment, machinery, and utilities necessary or appropriate for educational purposes; but does not include

athletic stadiums, or structures or facilities intended primarily for athletic exhibitions, contests, or games or other events for which admission is to be charged to the general public.

"(7) The term 'State' includes, in addition to the several States of the Union, the Commonwealth of Puerto Rico, the District of Columbia, Guam, American Samoa, the Virgin Islands, and the Trust Territory of the Pacific Islands.

"(8) The term 'State educational agency' means the State board of education or other agency or officer primarily responsible for the State supervision of public elementary or secondary schools, or if there is no such officer or agency, an officer or agency designated by the Governor or by State law."

Chairman PERKINS. Let me thank all of you for your appearance here today. As I said, I am sure that this hearing today will establish the need for such legislation.

Our first witness this morning is Dr. Shirley Hansen, special legislative assistant, American Association of School Administrators.

Come around, Dr. Hansen.

The next witness is Mr. E. C. Grayson, Superintendent of Schools, Louisville, Kentucky.

I am delighted to welcome you here, Mr. Grayson.

Dr. Robert Den Hartog, Associate Superintendent of Schools, Lincoln, Nebraska, and Mr. John Lucas, Superintendent of Schools, Kettering, Ohio.

We will start with Dr. Hansen. Before we have questions, let me welcome you all here.

Dr. Hansen, you may start. Proceed in any manner you prefer.

Without objection, all of the prepared statements will be inserted in the record at this time.

Go right ahead.

STATEMENTS OF DR. SHIRLEY HANSEN, SPECIAL LEGISLATIVE ASSISTANT, AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS, E. C. GRAYSON, SUPERINTENDENT OF SCHOOLS, LOUISVILLE, KENTUCKY, DR. ROBERT DEN HARTOG, ASSOCIATE SUPERINTENDENT OF SCHOOLS, LINCOLN, NEBRASKA, AND JOHN LUCAS, SUPERINTENDENT OF SCHOOLS, KETTERING, OHIO

STATEMENT OF DR. SHIRLEY HANSEN

Dr. HANSEN. Thank you, Mr. Chairman.

We would like to summarize the testimony that will be submitted for the record and then respond to questions.

I am very pleased to appear here today on behalf of the American Association of School Administrators and offer testimony on the Emergency Assistance for Schools Act.

As you have indicated, with me is Mr. E. C. Grayson, superintendent of the local public schools, who also is chairman of our Federal Policy and Legislation Committee at AASA, and Dr. Robert Den Hartog, who is immediate past president of the American School Business Officials, who has direct interest in the operation of the school plants, and Mr. John Lucas, who is superintendent of Kettering, Ohio, who I am sure will offer some interesting remarks regarding the experiences Ohio had this past winter.

Mr. Chairman, I don't believe any sector of the economy has been harder hit than the schools by the energy dilemma that faces this country. Education dollars have been mere whisps of smoke, and children have been locked out of their schools because schools have been denied the gas to keep the boys and girls warm.

Back in 1976, superintendents identified energy as their No. 1 priority, but those frustrations have really grown since that time, and so the Association of School Administrators, representing superintendents across the country, wishes to commend you for recognizing this critical problem to education and to the country by introducing the Emergency Assistance for Schools Act.

Since the embargo of 1973, energy has been a pervasive and very costly problem for the schools. In the 2-year period immediately following the embargo, energy costs rose 48.3 percent, or the schools were paying an additional $514 million for energy. This is based on an FEA survey which has been attached for the record.

Based on that FEA data, and energy escalation rates reported by the Department of Commerce, schools are now paying $1.8 billion for energy, and if we go a step beyond, and look at what the Department of Defense is instructing the military to calculate their energy cost prediction, then by 1980 the schools will be paying $3 billion for energy costs, if they continue on the present course. That is a 300 percent rise since the embargo only 7 years previously.

Where are these energy dollars coming from? Well, school administrators only have two choices: they either go to the taxpayer and increase the taxpayer's burden, or they cut educational programs. Voter reluctance has been obvious, and I am sure the chairman is well aware of it.

That leaves only cutting education dollars which should be helping children learn. This bill can provide an alternative to the vicious circle that is dragging children's education down as energy costs spiral upward. We are unfortunately encumbered with schools that were built when space was critical and energy was not.

Now today education and the nation is paying dearly for those buildings. It has been estimated that nearly 50 percent of the energy consumed by the schools is wasted, and it is documented that on fairly conservative expenses in the capital area tht 50 percent can be reduced.

Saving School House Energy, a project initiated by AASA to demonstrate the desirability of retrofitting schools has found that for a mean expenditure of around $26,000 on elementary schools of approximately 40,000 square feet, the energy on the average across those 10 schools can be reduced 50 percent, and the costs expended to do this job can be recovered by school site in from 1 year to no more than 8 years.

Our problem, of course, is where do you get the money to institute those retrofits? In 1975, the last year on which we have complete data, over half of the school bond referendums which go to finance capital investments in this country were defeated. The FEA survey cited earlier 60.8 percent of the school districts reported that they lacked the money to undertake desired energy conserving measures in their building. The irony is that the schools see this money that could go into energy conserving measures going up the chimney in smoke. School administrators desperately need Federal help to help themselves and this bill can do that. It is not another perennial categorical program. This is a one-shot legislation that can reduce energy consumed and bring relief to the schools on a continuing basis.

The matching grant approach in this bill can provide a strong incentive to the schools to seek these kinds of energy savings. The technical assistance and the demonstration grants provided will provide the help the schools need to find ways to conserve energy, and most importantly, the basic grants will see that retrofitting is enacted.

The bill provides for direct assistance to the schools, the recipients of this funding, where it will be most beneficial. Dollars to the State Department of Education or dollars to the governors lose something along the way. The governors and the State energy plans under EPCA have disregarded schools primarily, and I get a considerable number of calls from superintendents expressing concern that schools were not considered in State energy plans.

Education is the only industry that exists in every community in the country. School buildings are very visible representations of that industry. I met recently in the miniconference with Mr. Schlesinger's people and this was a great concern to them. How are we going to turn around the attitude of the public, and how can we help people in the classroom?

I would suggest that if we are doing things right around the children to the very walls of their classroom, they will get excited and curious. They will want to know why, and if they understand the reason for energy conservation, they are the greatest energy ambassadors to the homes this country can find.

In the winter of 1977 over 40 million pupil-days were lost due to the energy shortage. Peter Relic, former superintendent in Ohio, and Deputy Assistant Secretary for Education, recently noted: "There are children now in the schools who will be placed inappropriately next year because of what happened this past winter. Children will be retained...children will be passed on...who shouldn't be. If even one child is hurt because of last winter, it was a catastrophe."

We must avoid another catastrophe.

If consumption is markedly reduced by modifications, the same number of BTUs can keep schools operating for more days next winter.

To continue on our present course is a waste of the nation's energy, a waste of the taxpayer's dollar, and a denial to American children of a full education.

I have with me today, Dr. Robert Den Hartog, who has an exemplary operational program, but you can only go so far on the quick fix, and he can talk very well to that and what the needs are in Lincoln, Nebraska.

Mr. Grayson has had to just this past week severely cut educational programs, and I think can speak very cleary to the ramifications to education brought about by escalating energy costs, and Mr. Lucas would like to address some of the hardships children experience.

[The statement referred to follows:]

AASA

American Association of School Administrators

STATEMENT ON BEHALF

OF THE

AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS

Before the

Subcommittee on Elementary, Secondary and Vocational Education

of the

House Committee on Education and Labor

Concerning

HR 5996

EMERGENCY ASSISTANCE FOR SCHOOLS ACT

Submitted by

Dr. Shirley J. Hansen, Associate Director
American Association of School Administrators

Accompanied by

Mr. E. C. Grayson, Superintendent, Louisville, Kentucky;
Dr. Robert Den Hartog, Associate Superintendent, Lincoln, Nebraska;
Mr. John Lucas, Superintendent, Kettering, Ohio

May 3, 1977

1801 N. Moore Street, Arlington, Virginia 22209 (703) 528-0700

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Mr. Chairman and members of the Committee, I am Shirley Hansen. I am pleased to appear before you today on behalf of the American Association of School Administrators (AASA) to offer testimony on the Emergency Assistance for Schools Act. With me are Mr. E. C. Grayson, Superintendent, Louisville Public Schools, Louisville, Kentucky; Dr. Robert Den Hartog, Associate Superintendent, Lincoln Public Schools, Lincoln, Nebraska; and Mr. John Lucas, Superintendent, Kettering, Ohio.

Mr. Chairman, in the energy dilemma that faces this country, no sector of the economy is harder hit than the schools. Education dollars have become mere wisps of smoke and children have been locked out of their schools because schools have been denied the gas to keep boys and girls warm. School superintendents identified energy as their "No. 1 priority" in 1976. Their frustrations and concerns have been mounting ever since. The American Association of School Administrators, representing superintendents across the nation, wishes to commend you for recognizing this critical problem to education and to the country by introducing the Emergency Assistance for Schools Act.

Our cornucopia way of life has been dramatically upset by energy shortages and increasing energy costs. School administrators, just like others across the nation, tipped up the horn of plenty in 1973 and again in the "Winter of '77" and found our fossil fuel resources are not inexhaustible. Since the embargo of 1973, energy has been a pervasive and very costly problem for the schools.

A Federal Energy Administration (FEA) survey released last fall showed that in the two-year period following the embargo, the schools' energy costs had risen 48.3%. In 1974-75, the schools paid $514 million more for energy than they had just two years before. The FEA survey is attached for the record.

Based on the FEA data and the energy escalation rates for the intervening years reported by the Department of Commerce, the schools are now paying $ 1.816 billion for energy. That's an increase of $ 758 million in the school fuel bill since the embargo.

All indications are that energy costs will continue to rise rapidly. The Department of Defense recently instructed the military to calculate their energy cost predictions at 15% for oil and 20% for gas, coal, and electricity compounded annually through 1980. Using this escalation rate with constant demand figures, the schools will be paying at least $ 3 billion by 1980, an increase of $ 2 billion over 1973 fuel costs.

Where are these energy dollars coming from?

Unlike other sectors of the economy, there is no way for the schools to incorporate those increased energy costs in the product. School administrators have two choices: go to the tax payer for more revenues or cut educational programs. Voter reluctance to increase their local tax rates is well known. In 1974, California passed only 37.5% of their millage elections and few states reach a passage rate of 60%.

But schools must pay the fuel bill. Where do they get the money? All too often, it comes from the education dollars which should be helping children learn.

This bill can provide an alternative to the vicious circle that is dragging children's education down as energy costs spiral upward. It offers the schools an opportunity to break out of the pattern, to conserve energy, and to put dollars back into the classroom.

The schools in use today were built when space was critical and energy was not. The "baby boom" buildings are exceedingly energy inefficient. Today education and our nation is paying dearly for those buildings. It has been estimated that nearly 50% of the energy consumed by the schools is wasted.

For relatively small investments, major energy savings can be achieved. Some time ago, AASA initiated a project, Saving Schoolhouse Energy, to demonstrate the desirability of retrofitting school buildings and to provide school administrators with guidelines for cost-effective energy conserving measures. Ten representative elementary schools across the nation were selected for the study. The preliminary results of the engineering analyses in the AASA project show that for a mean expenditure of $25,923 energy consumption can be reduced an average of 50% and the costs can be recovered in as little as one year and no more than 3 years. A Management Summary of these preliminary findings is submitted for the record.

Unfortunately, knowing these kinds of savings could be effected doesn't help if you don't have the capital funds to modify the buildings

to conserve energy. In 1975, over half of the school bond referendums in this country were defeated. In the FEA survey cited earlier, 60.8% of the school districts reported that they lack the money to undertake desired energy conserving measures in their buildings. Ironically, increasing energy costs are consuming the dollars that could fund energy conserving modifications.

School administrators desperately need federal help to help themselves. This bill can do that. It is not another perennial categorical program. This "one-shot" legislation can reduce energy consumed and bring relief to the schools on a continuing basis.

The matching basic grant approach should provide a strong incentive for schools to seek these kinds of energy savings. Technical assistance is greatly needed for the school administrators anxious to conserve energy, but unsure as to the most cost-effective energy conserving opportunities available to them. The authorizing levels in the bill place emphasis on basic construction grants and technical assistance. This is as it should be. While demonstration grants can seek to find more effective remedies for conserving energy in the schools, quick maximum effectiveness of any federal expenditure can be realized by putting simple known energy conserving measures in the schools---now.

Education is the only industry that exists in every community in the country. School buildings are very visible representations of that industry. It is most appropriate that the Congress bring forth efforts to conserve energy in these buildings, for its ripple effect will affect other sectors of the economy. Children get very

excited when the walls of their classroom change right around them. They want to know why. Children who understand the reason for energy conservation are the greatest energy ambassadors to the homes of this country that we can find.

Mr. Chairman and members of the Committee, every effort must be taken to avoid another "Winter of '77". Over 40 million pupil-days were lost due to the energy shortage. Peter Relic, Deputy Assistant Secretary for Education, has noted,

> There are children now in the schools who will be placed inappropriately next year because of what happened this past winter. Children will be retained. . . children will be passed on. . . who shouldn't be. If even one child is hurt because of last winter, it was a catastrophe.

We must avoid another catastrophe.

If consumption is markedly reduced by modifications, the same number of BTUs can keep schools open more days next winter.

To continue on our present course is to waste the nation's energy, waste the tax payer's dollar, and deny America's children a full education.

This bill can change that course and prevent the waste of energy resources and human resources.

Thank you, Mr. Chairman, for recognizing the magnitude of this problem by introducing this bill. Your interest and support in this critical area is greatly appreciated by the American Association of School Administrators.

Each of the panel members with me today can highlight the concerns I have raised by offering a few comments based on their experiences. We would all be pleased to answer any questions members of the Subcommittee might have.

Thank you.

AASA

American Association of School Administrators

SURVEY OF SCHOOL DISTRICT FUEL COSTS:

IMPACT OF RISING FUEL COSTS ON EDUCATION

In a study conducted by the Federal Energy Administration (FEA), and endorsed by the American Association of School Administrators, the following information was developed and reported by FEA.

The median school district in the United States spent $29.77 per pupil for fuel in 1974-75 compared to $20.07 in 1972-73, before the Arab oil embargo. This represents an increase of $9.70 per pupil, or 48.3%, over the two years. At the same time, consumption dropped 3%.

But that tells only part of the story. Oil-dependent regions have been hit harder than most. For example, in New England the median expenditure for oil--the major heating fuel--increased 136% from $11.23 per pupil to $26.43 during the two years, despite the fact that consumption was cut almost 8%. In New York and New Jersey, median costs for oil rose 126% on a per pupil basis, while use of oil decreased 15%.

These facts are among a series of revealing statistics developed by the Federal Energy Administration (FEA) in a national survey of school district fuel costs and consumption. The study used figures supplied by a sample of 498 school districts, selected to represent the Nation as a whole.

Among other statistics developed by the study:

- The Nation's public schools spent an estimated $514 million more on fuel in 1974-75 than they did in 1972-73. At current salary rates, that represents about 43,000 teaching positions.
- In New England, the extra cost of all fuel over the two-year period, had it been put back into school programs, could have provided another 4,900 teachers. New York and New Jersey could have added 8,300 teachers had districts in those States been able to hold fuel costs to 1972-73 levels. Districts in the Great Lakes States could have purchased the services of 9,900 teachers for the extra dollars spent on fuel.
- The cost per pupil of oil increased more rapidly (93% over the two years, nationally) than the cost of other fuels. The consumption of electricity increased by 10% despite the fact that its cost increased by more than 39%, or almost $5 per pupil.

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- Gas-using regions of the United States were the least hard hit by increased fuel costs (ranging around a median increase of $5 per pupil) though some districts found themselves limited in the amount of fuel they could use.

- School districts in general (60.8% of them) reported that they lack money to undertake changes and modifications in buildings and in their heating and ventilating systems, needed to conserve fuel. Age of buildings (54.8% of those responding), lack of proper temperature controls (50.6%), and leaky windows (48.4%) were most often cited as principal obstacles that had to be overcome in order to conserve fuel.

- Because so many schools built in the last 10 years are air conditioned, school districts in warm climates now face severe problems when fuel costs rise. These districts, for the most part, depend on electric power for air conditioning. In the Southeast, for example, the median district increased its use of electricity by less than 20% but saw its costs rise by more than 49%.

In addition to cost and consumption figures based on numbers of pupils, the study received and computed information on square foot costs and consumption and on costs and consumption based on degree days. Fuel costs as a percentage of the total current budget were also computed. (In the median district nationally, the cost of fuel rose from 2.48% of the current budget to 2.84%. Its increase as a proportion of each district's discretionary budget is even greater.)

The FEA's study--made possible by the cooperation of so many individual school districts--represents the first major national effort to learn what the impact of rising fuel costs has been on education.

TABLE I

ENERGY COST/CONSUMPTION PER PUPIL NATIONALLY

Cost/pupil	25th Percentile	Median	75th Percentile	% Change of Median
1972-73				
Fuel Oil	$ 1.59	$ 5.52	$ 9.73	
Natural Gas	2.39	4.79	7.60	
Coal	.41	1.43	2.90	
Electricity	8.99	11.95	15.79	
Propane	.17	.36	.93	
Total Energy	15.23	20.07	26.23	
1974-75				
Fuel Oil	$ 2.81	$10.65	$22.54	92.9%
Natural Gas	3.39	6.75	10.63	40.9
Coal	1.04	2.50	5.88	74.8
Electricity	12.27	16.65	23.33	39.3
Propane	.23	.61	1.62	69.4
Total Energy	21.52	29.77	43.04	48.3
Consumption/pupil				
1972-73				
Fuel Oil (Gal.)	12.44	37.17	74.15	
Natural Gas (CF)	2,678.01	5,694.48	10,478.41	
Coal (Tons)	.03	.10	.26	
Electricity (Kwh)	350.32	507.60	707.53	
Propane (Gal.)	.60	2.04	6.59	
Total Energy (000'sBTU)	10,722.85	16,262.11	20,972.44	
1974-75				
Fuel Oil (Gal.)	8.96	33.33	66.99	-10.3
Natural Gas (CF)	2,558.42	5,813.01	10,037.84	2.0
Coal (Tons)	.03	.07	.28	-30.0
Electricity (Kwh)	393.61	558.80	747.48	10.0
Propane (Gal.)	.61	1.64	4.91	-19.6
Total Energy (000'sBTU)	10,745.67	15,768.78	20,409.47	-3.0

HOW TO READ THIS CHART: The median district, nationally, spent $5.52 per pupil for fuel oil in 1972-73; $10.65 per pupil in 1974-75, an increase of 92.9%. One quarter of the districts spent $1.59 per pupil or less in 1972-73. One quarter spent $9.73 or more that year. In 1974-75 the equivalent figures were $2.81 and $22.54.

NOTE: These figures are medians, not averages. Thus, it is not possible to add up the costs for each individual fuel to get a total fuel cost.

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TABLE II

MEDIAN ENERGY COST/CONSUMPTION PER PUPIL
BY REGION AND DISTRICT SIZE

		$/Pupil, All Fuel			Consumption/Pupil, All Fuel		
		1972-73	1974-75	% Change	1972-73	1974-75	% Change
Nation		$20.07	$29.77	48.3%	16,262*	15,768	-3.0%
Region	1	$24.46	$47.14	92.7%	17,728	16,914	-4.5%
	2	28.06	48.04	71.2	18,893	18,826	-0.3
	3	23.52	39.21	66.7	17,848	18,369	2.9
	4	15.80	24.99	58.1	10,117	9,972	-1.4
	5	24.09	36.30	50.6	19,005	19,750	3.9
	6	15.06	20.89	38.7	13,517	13,152	-2.7
	7	21.33	26.13	22.5	17,973	18,574	3.3
	8	18.77	24.93	32.8	17,691	18,816	6.3
	9	14.96	20.67	38.1	10,309	9,089	-11.8
	10	19.57	27.00	37.9	19,671	17,185	-12.6
Size	1	$17.51	$26.78	52.9%	8,524	7,706	-9.5
	2	20.58	28.84	40.1	15,482	16,377	5.7
	3	18.72	30.98	65.4	16,477	15,713	-4.6
	4	21.03	34.02	61.7	16,508	16,554	0.2
	5	19.98	28.09	40.5	17,839	17,185	-3.6
	6	22.83	32.88	44.0	16,894	16,393	-2.9

*ooo's BTU's per student

Regions

Size Groups

1 more than 25,000 students
2 10,000 - 24,999
3 5,000 - 9,999
4 2,500 - 4,999
5 1,000 - 2,499
6 under 1,000

TABLE III MEDIAN COST AND CONSUMPTION OF ALL FUEL PER 1,000 SQUARE FEET OF BUILDING

	Cost per 1,000 square feet (median)			Consumption per 1,000 square feet (median)* (in 000's of BTU's)		
	1972-73	1974-75	Percentage change	1972-73	1974-75	Percentage change
NATIONAL	$204.50	$286.04	39.8%	161,312	148,113	- 8.1%
REGION 1	262.76	437.77	66.6%	176,710	157,031	-11.1%
2	266.29	442.66	66.2%	185,999	171,487	- 7.8%
3	224.74	374.67	66.7%	166,069	152,559	- 8.1%
4	187.32	269.82	44.0%	112,013	109,568	- 2.1%
5	238.05	324.85	36.4%	184,948	171,972	- 7.0%
6	148.86	198.22	33.1%	132,603	137,354	3.5%
7	179.03	219.46	22.5%	163,245	142,522	-12.6%
8	171.68	243.61	41.9%	182,640	170,074	- 6.8%
9	205.85	269.17	30.7%	131,342	122,435	- 6.7%
10	168.26	233.09	38.5%	162,761	138,068	-15.1%
SIZE 1	177.43	260.11	46.6%	101,066	92,996	- 7.9%
2	219.07	304.44	38.9%	173,513	162,158	- 6.5%
3	216.83	326.62	50.6%	170,380	145,385	-14.6%
4	201.18	317.01	57.5%	164,622	152,067	- 7.6%
5	188.81	251.65	33.2%	166,948	156,095	- 6.5%
6	201.65	256.85	27.3%	154,224	147,334	- 4.4%

* To record fuel consumption in BTU's, the following conversions were used:

Fuel oil, 1 gallon = 138,700 BTU; Natural gas, 1 cu. ft. = 1,031 BTU;
Electricity, 1 kwh = 11,600 BTU; Coal, 1 ton = 24,580,000 BTU;
Propane gas, 1 gallon = 95,500 BTU.

TABLE IV

ESTIMATED EXPENDITURES FOR ALL FUEL

	Expenditures 1972-73 (000's)	Expenditures 1974-75 (000's)	New Expenditures (000's)	Equivalent Teacher Positions
National	$938,000	$1,452,000	$514,000	43,200*
Region 1	$ 61,811	$119,894	$ 58,083	4,900
2	139,289	238,669	99,380	8,300
3	116,576	194,542	77,966	6,500
4	113,011	178,944	65,933	5,500
5	233,693	352,340	118,647	9,900
6	72,295	100,481	28,186	2,400
7	63,261	77,697	14,436	1,250
8	26,946	35,989	9,043	800
9	81,452	112,817	31,365	2,650
10	29,468	40,932	11,464	1,000
Size 1	$252,296	$392,865	$140,569	11,800
2	189,470	270,332	80,862	6,800
3	165,790	279,346	113,556	9,500
4	165,575	272,706	107,131	9,000
5	127,421	182,391	54,970	4,600
6	37,689	55,263	17,574	1,500

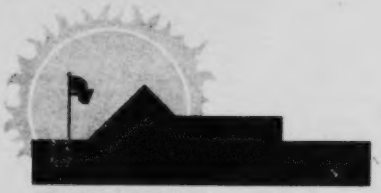
*Based on current estimated average teacher salaries.

HOW TO READ THIS CHART: In Region 1, school districts spent almost $62 million on all fuels in 1972-73 ($61,811,000). In 1974-75 they spent almost $120 million, an increase of $58 million. Had that money been applied to teacher salaries, 4,900 more positions could have been filled.

Public Schools Energy Conservation Measures

DRAFT

MANAGEMENT SUMMARIES



SAVING SCHOOLHOUSE ENERGY

AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS

SAVING SCHOOLHOUSE ENERGY

The project, Saving Schoolhouse Energy, was initiated to demonstrate the desirability of modifying school buildings to achieve energy conservation, and to develop guidelines by which school administrators could identify the most cost-effective energy conserving opportunities in their buildings.

It should be stressed that the emphasis in this study is on cost-effective capital investments for energy conservation. In this type of study the recommended capital investments should not be implemented without first undertaking a comprehensive operational and maintenance program. This implies that sound energy management procedures, such as appropriate scheduling, periodic inspections, and routine maintenance are a continuing function. It further assumes that the human element--all building personnel and students--is cooperative and appreciative of the intent of the function desired.

The project is designed in five phases: (1) site selection and engineering analyses to identify and recommend cost-effective energy conserving opportunities; (2) architectural and design work; (3) installation, construction, or modifications to implement recommendations; (4) monitoring post-modification energy use to verify the projected energy savings; and (5) dissemination of the findings.

This publication summarizes the PRELIMINARY results of Phase 1. The Federal Energy Administration*, which funded this phase, is in the process of approving the final reports.

PHASE 1 -- MANAGEMENT SUMMARIES

PUBLIC SCHOOL ENERGY CONSERVATION MEASURES, REPORTS #1-10

A thorough and comprehensive engineering analysis of ten representative elementary schools across the nation was undertaken to identify cost-effective energy conserving opportunities. The reports of these studies are designed to provide school administrators, engineers, architects, and associated technical personnel with indicators of potential energy savers in similar buildings. The following information is a brief compilation of these findings and abbreviated management summaries of these ten reports.

The demonstration sites selected were constructed between 1925 and 1973, they were multi-level and single-story, and varied from double-loaded corridors to pod and open space schools; and they were widely dispersed geographically (Figure 1). Six of the schools used natural gas as a fuel source; two used oil; and two had gas/oil option. Fuel costs at the time

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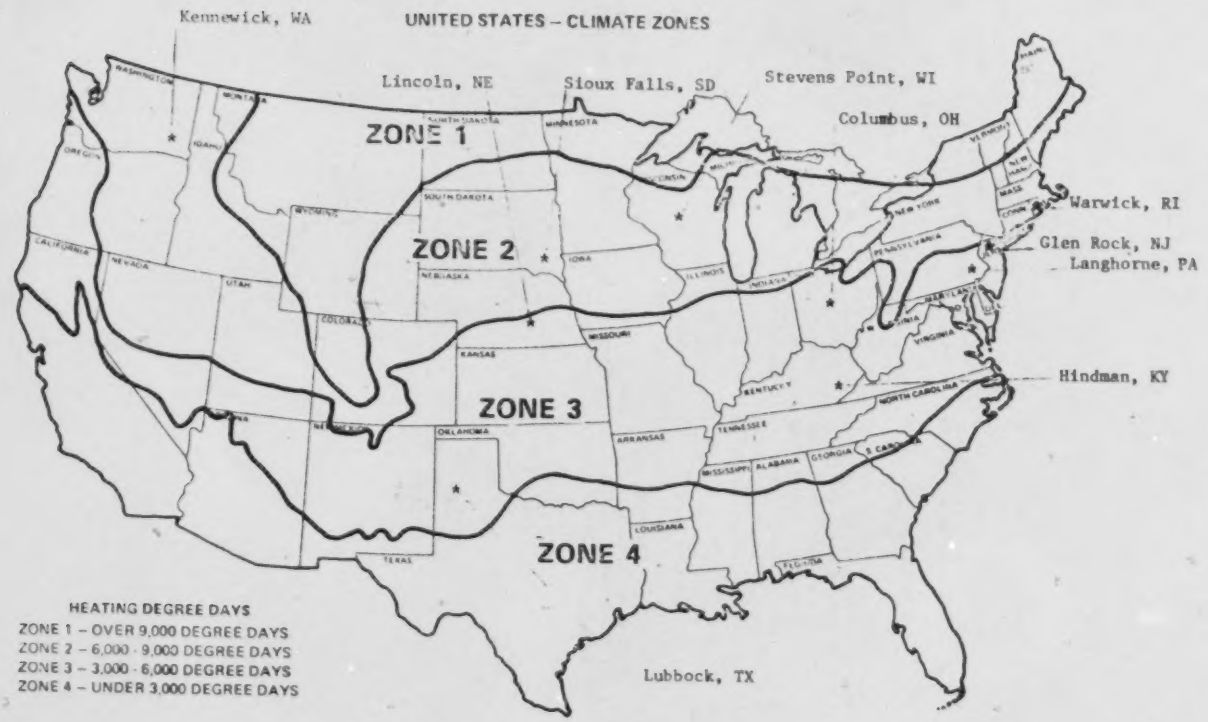
*Federal Energy Administration Contract No. CR-04-60711-00. The views and conclusions contained in this summary and in the engineering reports are those of the authors, and should not be interpreted as necessarily representing the official policies of the U.S. Government.

FIGURE 1. DEMONSTRATION SITES



studied ranged from $1.13/MCF to $3.36/MCF for natural gas and was approximately $0.34/gal for oil. All schools were heated; two used unit air conditioners; and one had central air conditioning. All ten schools operated on a standard school year.

Cost-effective energy conserving opportunities have been recommended for implementation at all sites. "Cost-effective" is defined as recovering the cost of investment within 12 years from the predicted energy savings. Calculations are based on current fuel costs with 10 percent per annum escalation adjusted for interest rates. By using the rather conservative 12-year payback period, the recommendations highlight the most cost-effective ECO's that should first be considered by school administrators -- remembering that school districts generally have very limited capital funds and must seek the most advantageous way to spend those funds.

Preliminary results show recommendations vary in cost by site from $1,000 to $80,425 with a mean recommended expenditure of $25,323. Preliminary projections suggest these expenditures will reduce energy consumption an average of 50 per cent across all ten sites. While modifications to the building envelope represent a significant portion of the total recommended expenditures, the most frequent recommendations were to adjust controls and to reduce outside air intake. Generally, they had the quickest recovery rate as well. Table 1 gives an overview of recommendations with associated capital cost estimates and recovery rates by site. Table 2 indicates the specific recommendations and estimated cost by site.

The recommendations made are for existing buildings with the characteristics as described. They offer guidelines for analyzing buildings with similar characteristics. However, suggested energy conserving opportunities must be weighed in terms of the fuel used, its cost and associated savings, as well as capital expenditure considerations. While it is not the primary intent of this report to address new construction concerns, the findings do have implications for such work.

It should also be noted that, in a free market, availability is reflected in cost. However, fuels have not had such a history. As long as fuel costs or supplies are in any way regulated, actual fuel availability may transcend the cost-effective characteristics of a modification.

As soon as the phase 1 engineering reports have been approved by the Federal Energy Administration they will be available at cost. An order blank is attached to this summary for your convenience. Inquiries related to the study should be addressed to:

Dr. Shirley J. Hansen, Director
Saving Schoolhouse Energy
AASA
1801 No. Moore St.
Arlington, VA 22209

or to AASA's consulting engineer:
JCox Associates
Engineers-Consultants
245 West Maple Avenue
Vienna, VA 22180

Following the summary tables is a brief description of each school and more details on the energy conserving opportunities (ECOs) recommended. Also noted are ECOs studied, but not recommended, at current fuel rates. As the cost of fuel exceeds the rate used in the calculations, such ECOs may become cost-effective and should be reviewed. Any reconsideration should not view adjusted energy and dollar savings in isolation; materials, labor, interest rates, etc. must also be assessed.

TABLE I. Demonstration sites, related information; ECOs, associated cost, and recovery rate.

Report No.	School	Location	Year(s) built/ sq. ft.	Fuel	Cost-effective ECOs	Est. Cost	Recovery rate avg. yrs.
1	Scott	Warwick, R.I.	1965,67/ 27,610 (pod)	gas	1.reduce outside air 2.night setback 3.replace boiler 4.add roof insulation	$ 42,800	7
2	Central	Glen Rock, N.J.	1925,39,50/ 45,384	oil	1.reduce outside air 2.replace boiler 3.chg.temperature settings 4.dampers 5.roof insulation 6.reduce infiltration	39,550	6
3	Everitt	Laughorne, Pa.	1954,58,67/ 49,314	oil	1.reduce outside air 2.replace boiler	21,200	7
4	Hindman	Hindman, Ky.	1957,66/ 32,338	gas	1.increase boiler efficiency 2.reduce glass 60%	13,659	6.3
5	Fairmoor	Columbus, Ohio	1949,55/ 42,765	gas	1.shut down unit vents, summer 2.improve boiler efficiency 3.night setback 4.reduce outside air	25,700	3
6	P.F. Brown	Lubbock, Tex.	1949,50,56/ 36,802	gas	1.update & improve controls	1,000	1.5
7	Eastridge	Lincoln, Neb.	1954,55/ 32,029	gas/ oil	1.reset & rebalance air handling units 2.night setback	10,000	6
8	Garfield	Sioux Falls,N.D.	1952,56/ 31,700	gas/ oil	1.reduce outside air 2.night setback 3.improve boiler efficiency	20,000	8
9	Plover Whiting	Stevens Point, Wisc.	1973/44,000 (open space, etc)	gas	1.improve air conditioning usage schedule 2.improve indoor lighting schedule 3.air temperature reset 4.reduce outside air	3,900	1
10	Washington	Kennewick, Wash.	1957/40,124	gas	1.mechanical adjustments 2.night setback 3.roof insulation 4.reduce glass 5.replace incandescent lighting	80,425	7.5

TABLE 2. Types of recommendations by site.

Given in cost/recovery rate, in years.

Site	Building Envelope			Lighting	Mechanical (HVAC Systems)						
					Boilers		A.C.	Controls			
	Insulate roof	Reduce glass	Infiltration		Improve efficiency)	Replace		Reduce O.A.	Night Setback	Change Temp.	Adjust u.v., dampers, controls
1. Scott	$17,300/7					$19,500/9		$6,000/5	$0/I* ($1535)		
2. Central	7,200/7		$6,000/6 1,350/2 louvers			20,000/6		5,000/5		$0/I* ($565)	
3. Everitt						20,000/11		1200/2			
4. Hindman		$ 5600/7			←	~~X~~	~~X~~	← $ 8,039/5 →		~~X~~	→
5. Fairmoor					$10,000/3			7200/4	8500/3		Unoccupied shut down $0/I* (844)
6. Brown											1000/1.5
7. Eastridge									baseboard radiators 8000/8	2000/4	
8. Garfield					9,000/12			3000/3	8000/8		
9. Plover Whiting				Schedule $0/I* ($3214)			Schedule $0/I* (2934)	3000/3		900/6	
10. Washington	35,407/11.8	5447/4.2		Replace incandescent 29,571/9.38							10,000/3.08

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* I for "immediate return. ( ) gives estimated first year savings.

DEMONSTRATION SITE NO.1: Harold C. Scott Elementary School
Warwick, Rhode Island

Building Characteristics:

1965 single story pod or modified open space school -- 27,610 sq.ft. with library, multipurpose, and administration areas. Walls are 4" face brick, 4" loose insulation, and concrete block with approximately 22% single pane glass. Roof has 2 1/2" insulrock supported by steel beams.

The building is heated by natural draft gas-fired boilers. Unit ventilators are in all classrooms, library, and multipurpose area. Convectors, radiators, and cabinet heaters are used in offices, toilets, and corridors. Gas consumption averages (85 MBTU/sq.ft.)

Illumination is primarily fluorescent. KWH/sq.ft. for all electrical demands averages 3.88.

400 students, K-6; 25 staff. School day: 9:00 a.m.-3:00 p.m. School year: early September-late June.

Total Annual Energy Consumption: 89.6 MBTU/sq.ft. @ 5550 Deg. Days.

Energy Conserving Recommendations:

- Rebalance unit ventilators to reduce outside air 500 cfm to 250 cfm (R.I. code 10 cfm/stu)
  Estimated cost: $6,000. Recovery Rate: less than 5 yrs.
- Revise occupied/unoccupied cycle - from 4:00 a.m.-4:00 p.m. to 8:00 a.m. to 3:00 p.m.; override for night use
  Estimated cost: $0.00. Recovery Rate: immediate. Projected savings 1st year: $1,535
- Replace gas-fired boilers with oil-fired boilers
  Estimated cost: $19,500.. Recovery rate: 9 years
- Add roof insulation during re-roofing
  Estimated Cost: $17,300. Recovery rate: 7 years

All recommendations: $42,800 (est.). Recovery: 7 years.

ECOs not recommended warranting future review: double glazing all windows

# # # #

DEMONSTRATION SITE NO. 2: Central Elementary School
Glen Rock, New Jersey

Building Characteristics:

Constructed 1925, 2 levels; 1939, one level addition similar construction. 45,384 sq. ft. Wall is 4" face brick, 2" air, 8" concrete block with plaster interior finish with 35% glass, double hung single pane. Roof is built up roofing over plywood deck; 3' drop in interior ceiling finished with plaster board or acoustical tile.

1958 addition is single level. Wall is 4 "face brick on 8" concrete block with 60% single pane casements. Roof is built up over wood sheathing with air space, 2" insulation and acoustical tile on interior surface.

Heated by (2) 1925 oil-fired low steam boilers (converted from coal). Unit ventilators and radiators in classrooms and auditorium. One pump for original structure and first addition; second pump for '58 addition -- controlled manually. Fuel consumption averages 0.94 gal/sq.ft.(131.6 MBTU/sq.ft.)

Illumination is primarily fluorescent. KWH/sq.ft. for all electrical demands averages 3.5.

300 Students, K-6; 30 staff (includes district administration personnel). School day 9:00 a.m.-3:00 p.m.; staff 8:00 a.m. to 6:00 p.m. School year: early September-late June. 15 adults 8:00 a.m.-6:00 p.m. in July. Vacated in August.

Total Annual Energy Consumption: 158 MBTU/sq.ft. @ 4590 Deg. Days.

Energy Conserving Recommendations:

- Reduce outside air
  --500 cfm to 175 cfm (state code)
  Estimated cost: $5,000. Recovery rate: 5 years
- Replace boiler with modular hot water boilers
  Estimated cost: $20,000. Recovery rate: 6 years.
- Reduce thermostat settings: 70 F to 68 F
  Estimated cost: $0.00 (maintenance). Recovery rate: immediate. Estimated savings 1st year: $565.00
  Install motor operated damper to close louvers and roof ventilators in auditorium
  Estimated cost: $1,350. Recovery rate: 2 years.
- Install roof insulation: -- blanket type in existing 3' airspace. Estimated cost: $7,200. Recovery rate: 7 years.
- Infiltration reductions:
  --weather stripping windows and doors
  --automatic damper at roof ventilator
  Estimated cost: $6,000. Recovery rate: 6 years.

All recommendations: $39,550 (est.). Recovery rate: 6 years

ECOs not recommended warranting future review: institute warm-up cycle with dampers closed.

DEMONSTRATION SITE NO. 3: Samuel Everitt Elementary School
Langhorne, Pennsylvania

Building Characteristics:

Constructed 1954 with two additions (1958, 1967); all have similar structure. 49,314 sq.ft. Walls are 4" face brick, air space, and 8" concrete block with approximately 45% glass in single pane casements. It has a built-up roof over 3 1/2" Insulrock supported by exposed steel beams.

Heated by (2) oil-fired hot water boilers. There is a 5.5 ton air conditioning unit for office area controlled by a 7 day time clock and two manually controlled window air conditioners for the library. Unit ventilators and radiators are used throughout the building. Fuel consumption .68 gals/sq.ft. (93.8 MBTU/sq.ft.).

Illumination is primarily fluorescent. KWH/sq.ft. for all electrical demand averages 3.27.

Everitt has 559 students, K-5. School day: 9:00 a.m. to 3:00 p.m. School year: early September to Mid-June. Used five nights per week and the office all summer.

Total Annual Energy Consumption: 108.9 MBTU/sq.ft. @ 4590 Deg. Days.

Energy Conserving Recommendations:

- Reduce outside air intake
  --500 cfm to 175 cfm (state req.)
  Estimated cost: $1,200. Recovery rate: 2 years.
- Replace boilers with modular hot water boilers
  Estimated cost: $20,000. Recovery rate: 11 years.

All recommendations: $21,200 (est.). Recovery rate: 7 years

ECOs not recommended warranting future review: double pane glass, and/or panel over clearstory glass.

# # # #

DEMONSTRATION SITE NO. 4: Hindman Elementary School
Hindman, Kentucky

Constructed in 1957 with addition of similar structure in 1966. Walls are 4" face brick, 2" air space, and 4" concrete block with 49% glass of 1/8" plate glass with aluminum frame. The roof is 1 1/2" rigid insulation, air space, and 2 3/4" blanket fiberglass on steel deck. Total area is 32,338 sq.ft.

Hindman is heated by a gas-fired cast iron sectional boiler with forced hot water circulating through convectors. Four sections were added in 1966 to accomodate addition. Classrooms do not have thermsotats. Building is controlled by zone of exposure. Annual fuel consumption .8CCF/sq.ft. (80 MBTU/sq.ft.).

Illumination is primarily fluorescent with level at approximately 60 foot-candles. Annual electrical consumption 2.58 KWH/sq.ft.

611 students, 1-7, and 32 staff occupy building from 8:30 a.m. to 3:30 p.m. 180 days, mid-August to mid-May.

Total Annual Fuel Consumption: 88.4 MBTU/sq.ft. @ 3320 Deg. Days.

Energy Conserving Recommendations:

- Increase boiler efficiency to 80%, reduce outside air, and repair zone control
  --clean, adjust boiler; establish appropriate controls
  --set unit ventilators for reduced outside air; close dampers on night set back
  repair and correct zone thermostats and 3-way valves
  Estimated cost: $8,059. Recovery rate: 5 years.
- Reduce glass by 60%.
  Estimated cost: $5,600. Recovery rate: 7 years.

All recommendations: $13,659 (est.). Recovery rate: 6.3 years

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# # # #

DEMONSTRATION SITE NO. 5: Fairmoor Elementary
Columbus, Ohio

Original structure build in 1949 was 23,500 sq.ft. on 3 levels. The walls are 4" brick face on 8" concrete block with 28% glass, N/S facing. Roof was rehabilitated 3 years ago with 2 1/2" insulating board on steel deck.

A 19,200 sq.ft. addition was added in 1955 bringing total square footage to 43,765 sq.ft. The addition is a single level. The walls are 4" brick face on 12" concrete block with 58% glass, E/W facing. The addition roof consists of built up roofing on 2 1/2" Tectum panels with no ceilings.

Fairmoor is heated by 2 gas-fired boilers converted from coal. There are unit ventilators in all classrooms -- steam in original section, hot water in addition. Therms/sq.ft. averages 1.5. (150 MBTU/sq.ft.).

Illumination is primarily fluorescent with mercury vapor and incandescent in multipurpose room. Electricity demand is 3.56 KWH/sq.ft.

475 students, K-6 and 30 staff occupy the building 8:45 a.m. to 3:15 p.m. from early September to mid-June.

Total Annual Energy Consumption: 180.6 MBTU/sq.ft. @ 5280 Deg. Days.

Energy Conserving Recommendations:

- Shut down unit ventilators in unoccupied summer months
  Estimated cost: $0.00. Recovery rate: immediate ($844 1st year)
- Improve boiler efficiency
  --replace burners
  --reduce flue size
  --install boiler controls to fire on demand
  Estimated cost: $10,000. Recovery rate: 4 years.
- Night set back
  --install time clock to shut unit ventilators, close dampers, stop exhaust fans
  Estimated cost: $8,500. Recovery rate: 3 years.
- Adjust unit ventilators to reduce outside air intake
  --air balance; upgrade controls
  Estimated cost: $7,200. Recovery rate: under 4 years.

All recommendations: $25,700 (est.). Recovery rate: under 3 years

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ECOs not recommended warranting future review: double glazing, insulate addition roof, add double doors, or reduce glass.

# # # #

DEMONSTRATION SITE NO. 6: P. F. Brown
Lubbock, Texas

Original 1949 structure and 1950 addition comprise 25,258 sq.ft. single level. Of similar construction - walls are 4" face brick on 8" structural tile with interior plastered with 16.5% glass, N/S facing. Roof is 3" concrete deck, ceiling plastered.

1956 addition brought total footage to 36,802 sq.ft. This addition is essentially the same with the exception of acoustical board on ceiling and the double hung windows have an E/W orientation.

P. F. Brown has one gas-fired, fire tube, low pressure steam boiler. There are no unit ventilators. Outside air by infiltration only. Gas consumption averages 0.91 MCF/sq.ft. (91 MBTU/sq.ft.).

Illumination is primarily fluorescent. Total electrical demand averages 2.185 KWH/sq.ft

388 students, K-6, and 48 staff occupy the building 8:00 a.m. to 3:00 p.m. late August through May.

Total Annual Energy Consumption: 102.5 MBTU/sq.ft. @ 3150 Deg. Days.

Energy Conserving Recommendations:

- Update and improve controls

Estimated cost: $1,000. Recovery rate: 1.5 years

ECOs not recommended warranting future reveiw: increase efficiency of heating plant.

Adding roof insulation, replacing glass blocks, and contracting weather stripping all had recovery rates over 50 years.

# # # #

DEMONSTRATION SITE NO. 7: Eastridge Elementary School
Lincoln, Nebraska

Constructed in 1954 and added in 1955, Eastridge has essentially the same structure. Walls are 4" brick on 4" cavity block with 4" face brick veneer. Glass is single pane clear and frosted above, 27% of wall with predominance N/S facing. Roof is built up tar and gravel on 3 1/2" cedar deck, 3/4" acoustical tile ceiling.

Eastridge is heated by 2 gas/oil fired hot water boilers. It has hot water baseboard radiators and hot water central air handling units.

Annual fuel consumption: .71 CCF/sq.ft. (71 MBTU/sq.ft.).

Illumination is fluorescent. Annual electric 3.7 KWH/sq.ft.

300 students, K-6, occupy the building from 8:40 a.m. to 2:40 p.m.; 25 staff members from 8:00 a.m.-4:30 p.m. for 178 days each year.

Total Annual Energy Consumption: 83 MBTU/sq.ft. @ 6040 Deg. Days.

Energy Conserving Recommendations:

- Resetting and rebalancing air handling unit
  Estimated cost: $2,000. Recovery rate: 4 years
- Night set back for baseboard radiation
  Estimated Cost: $8,000. Recovery rate: 8 years

Estimated cost: $10,000. Recovery rate: 6 years

ECOs not recommended warranting future review: add roof insulation, reduce glass by 17%, or add exterior wall insulation.

# # # #

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DEMONSTRATION SITE NO. 8: Garfield Elementary School
Sioux Falls, South Dakota

Constructed in 1952 and added to in 1956 for a total of 33,700 sq.ft. Garfield has two levels. Walls are 4" face brick on 8" concrete block with about 30% glass. Of this glass area, 70% is glass block and the remainder is plate. The roof is 4 ply pitch and felt, 2" semi-rigid insulation, and 1 1/2" metal deck.

Garfield is heated by 2 gas/oil fired hot water boilers. Hot water baseboards and hot water central air handling units handle the heating and ventilating requirements. Annual fuel consumption: 94 CCF/sq.ft. (94 MBTU/sq.ft.).

Illumination is primarily fluorescent. Annual electric usage 3.08 KWH/sq.ft.

500 students, K-6, occupy the building 8:30 a.m. to 3:15 p.m.; 26 full time and 8 part time staff are there from 8:30 a.m. to 4:00 p.m. for 180 days per year.

Total Annual Energy Consumption: 109.7 MBTU/sq.ft. @ 7860 Deg. Days.

Energy Conserving Recommendations:

- Reduce outside air to minimum code (5 cfm)
  Estimated cost: $3,000. Recovery rate: 3 years
- Night set back system
  Estimated cost: $8,000. Recovery rate: 8 years
- Improve boiler efficiency
  Estimated cost: $9,000. Recovery rate: 12 years

All recommendations: $20,000 (est.). Recovery rate: 8 years

ECOs not recommended warranting future review: add roof insulation, add exterior wall insulation, or reduction of glass.

# # # #

DEMONSTRATION SITE NO. 9: Plover Whiting Elementary School
Stevens Point, Wisconsin

Plover Whiting is an open space school of 44,000 sq.ft. constructed in 1973. It has three distinct wall types: (1) 3/8" diagonal wood siding, 1" rigid insulation, 3/4" air space, and 8" concrete block; (2) as "1" with 12" concrete block around gym; and (3) 3/8" wood siding, 3/8" gypsum sheathing, 2" air space, 3 1/2" batt insulation on 6" stud wall with 5/8" GWB on interior. Glass averages 6.9%. Roof is built up, 1 1/2" rigid insulation, 1 1/2" metal deck, and 3/4" acoustical ceiling tile.

Plover Whiting is heated/cooled by 2 forced draft gas-fired boilers and 120 ton reciprocating chiller with air cooled condensing. Classrooms and multi-purpose are heated, ventilated and air conditioned by 3 central air handling units. Uses average .9 therms/sq.ft. (90 MBTU/sq.ft.).

Illumination is primarily fluorescent. Electrical load demand is approximately 10.5 KWH/sq.ft.

472 students, K-6, and 28 staff occupy the building from 9:00 a.m. to 3:30 p.m. for approximately 180 days, late August to mid-June.

Total Annual Energy Consumption: 132 MBTU/sq.ft. @ 7590 Deg. Days.

Energy Conserving Recommendations:

- Improve air conditioning usage schedule
  Estimated cost: $0.00. Recovery rate: immediate ($2,934 1st year)
- Improve indoor lighting usage schedule
  Estimated cost: $0.00. Recovery rate: immediate ($3,214 1st year).
- Air temperature reset mixed and supply
  Estimated cost: $900. Recovery rate: 6 years
- Reduce outside air intake to minimum code (5 cfm/person) --rebalance outside, return, and exhaust dampers
  Estimated cost: $3,000. Recovery rate: 3 years

All recommendations: $3,900 (est.)
Recovery rate (investments only): 2 years
all recommendations: 8 months.

ECOs not recommended warranting future review: add roof insulation and/or add wall insulation.

# # # #

DEMONSTRATION SITE NO. 10: Washington Elementary School
Kennewick, Washington

Washington is a single level structure built in 1957 with no addition. The three wing double loaded corridors has a total area of 40,124 sq.ft. Walls are precast panels and 3/4" rigid insulation with 50% glass (1/4" plate). The roof is built up roofing with 2" rigid insulation on steel deck with 2% sky-light.

Heating is by a gas-fired induced draft steel boiler. Distribution is on 3 zones with unit ventilators in classrooms, multipurpose, and administrative areas. Consumption averages .87 therms/sq.ft. (86.9 MBTU/sq.ft.).

Illumination is incandescent throughout. Total electrical demand is approximately 6.14 KWH/sq.ft.

503 students, K-6, occupy the building 9:00 a.m. to 3:15 p.m. and the staff from 8:00 a.m. to 3:45 p.m. from early September to mid-June.

Total Annual Energy Consumption: 107.8 MBTU/sq.ft. @ 5300 Deg. Days.

Energy Conserving Recommendations:

- Mechanical adjustments and maintenance
  --bring outside air up to code (5 cfm)
  --bring pump, filters, coils, fan motors, and damper linkages to maximum efficiency
  --calibrate and reduce thermostat settings
  --provide night setback capability
  Estimated cost: $10,000. Recovery rate: 3.08 years
- Add roof insulation in re-roofing process
  --3" rigid insulation
  Estimated cost: $35,407. Recovery rate: 11.8 years
- Reduce glass by 28% - fixed window modules with N, E or W exposure
  Estimated cost: $5,447. Recovery rate: 4.2 years
- Replace incandescent lighting with fluorescent at code (50 classroom, 20 corridors)
  Estimated cost: $29,571. Recovery rate: 9.38 years

All recommendations: $80,425 Recovery rate: 7.5 years

ECOs not recommended warranting future review: change from gas-fired to electric boiler.

ORDER FORM

Public School Energy Conserving Measures

Report No.

1. **SCOTT:** *1965,67 pod; replace boilers, add roof insulation, controls ($37,800/5 yr. return)* _____
2. **CENTRAL:** *1925,39,50; replace boilers, roof insulation, reduce infiltration, controls ($39,550/5 yr. return)* _____
3. **EVERITT:** *1954,58,67; replace boiler, reduce outside air ($21,200/9 yr. return)* _____
4. **HINDMAN:** *1957,66; increase boiler efficiency, reduce outside air, night set back, controls, reduce glaze 60% ($13,659/6.3 yr. return)* _____
5. **FAIRMOOR:** *1949,55; improve boiler efficiency, revise unoccupied settings, reduce outside air, night set back ($25,700/3 yrs. return)* _____
6. **P.F. BROWN:** *1949,50,56; update and improve controls ($1000/1.5 yr. return)* _____
7. **EASTRIDGE:** *1954,55; reset and rebalance air handling units; night set back ($10,000/5 yr. return)* _____
8. **GARFIELD:** *1952,56; reduce outside air, night set back, improve boiler efficiency ($20,000/10 yr. return)* _____
9. **PLOVER WHITING:** *1973; air condition schedule, indoor lighting schedule, air temperature reset, reduce outside air ($3,900/1 yr. return)* _____
10. **WASHINGTON:** *mechanical adjustments, night set back, roof insulation, reduce glass, replace incandescent lighting ($80,425/7.5 yr. return)* _____

_____

No. Reports Requested _____

Each report at cost ($2.50) including postage and handling as soon as cleared by Federal Energy Administration.

Enclosed is $_____ (# reports X $2.50)

Make check payable to AASA-Energy and mail to:

Dr. Shirley J. Hansen
AASA-OGR
1801 North Moore Street
Arlington, VA. 22209

Chairman PERKINS. Just proceed as you wish. Identify yourself for the record.

STATEMENT OF DR. ROBERT DEN HARTOG

Dr. DEN HARTOG. I am Robert Den Hartog, associate superintendent, and the immediate past president of the Association of School Business Officials.

Mr. Chairman and members of the committee:

I appreciate this opportunity to discuss with you the problems and the escalating costs of energy in the elementary and secondary schools of America—and particularly to speak as a practicing school business official—who has the responsibity for the efficient use and prudent management of an energy program with gross expenditures that will exceed $1 milion for all energy and utilities during the current school year.

The Lincoln school district provides an educational program for 27,000 students and has a need to provide energy and utilities for 3¾ million square feet of facilities.

As past president of the Association of School Business Officials, I traveled through 26 States during 1976 and visited with many school people related to their energy problems. The problems are quite similar but the readiness, understandings and effects are quite different from district to district and State to State.

It is not necesary for me to elaborate on individual cases as you are well aware of the national problem as to the supply, delivery, distribution, and energy costs. However, I woud like to present some practical history from the Lincoln district which can be verified and is presented for your information to make a point that help is needed.

Before I present the Lincoln facts, I wish to say that even though our figures may appear high, that our problem is not as severe as in other sections of the country.

In a study from the University of Alabama, and printed in our local newspaper, it stated that in Lincoln, Nebraska 30,000 cubic feet of gas costs $46 and in Fairmont, Minnesota the same 30,000 cubic feet costs $343 or approximately 7½ times as much. In Lincoln 1,000 kilowatts of electricity would cost $29 whereas in Tallahassee, Florida the cost would be $47 or approximately 160 percent. I do not know the validity of the report but I am sure that your committee has this type of comparison available.

In 1972-73, when the "first crisis" was reported, our district took immediate action to reduce the amount of oil, gas, and electricity used. We, of course, lowered the temperature settings, installed time clocks, checked the efficiency of all burners. A program of light reduction was instituted, and as a result we reduced our electricity consumption in excess of 36 percent. Note that I said energy consumption, not cost. For as we reduced the amount used, the prices increased steadily.

We reduced the amount of air movement and shortened the length of the time that the building was heated.

These procedures were very effective for a while but bring to a forefront a real problem that needs study and resolution. The

problem is: Who sets lighting standards and determines the amount of fresh air needed? How are these interpreted in real construction, and how do we operate with them today?

It is evident that certain interests promulgated optimum standards and that when energy was "cheap" we should error on the high side and provide maximum comfort. Since our buildings have been rewired and relighted within the last 15 years we were using these "optimum" standards and as we reduced them we had many complaints. In our studies, we found that air conditioning loads were determined by using the hottest day on record and with the building occupied to its maximum. Obviously this situation may never occur, especially in a school building where the hottest day is in August and usually schools are not in session at that time. We found that fresh air and air movement in the gymnasium was based on the maximum number of persons present for the seating available, and due to lack of automated controls or realization of the true facts we have continued to move air hourly within that area when small groups are present or even when no one is present.

Consequently, there is a need for further study as to minimum acceptable standards in these areas so that school officials can operate on the basis of professional judgments which are made with assumptions that are appropriate for today's thinking and in today's energy world.

In addition to standards, the school business officials are concerned about priorities. We recognize that the closing of schools has a minimal effect, if any, on the GNP and has little or no effect on unemployment. However, we question a priority system that permits the excess lighting on highways, streets, and for advertising, and deprives a school age child from a day of school. We believe that the classroom is important and are willing to compromise but believe that the decisionmakers, those who establish the priorities, should give further examination to the closing of schools as an energy conservation measure.

I fear that there may be a wrong assumption about closing schools that assumes that all of the energy will be saved. We must remember that school buildings were built by competitive bids when energy was cheap. In those areas with a cold climate, when buildings are closed and the temperature goes below 50 degrees, there is extreme danger of frozen pipes and, as a result, unnecessary expenditures for repairs.

Through study and examination with funds available in H.R. 5996, there is a need to determine the true costs and/or savings when a school is closed as compared to when it is kept open at the lowest possible operating temperatures with the students present. As an educator and school business official, I encourage further study in this area.

The reporting of any facts is open to analysis and interpretation for there are many variables to include. One must be careful to include all factors which can affect the conclusion.

[The information follows:]

The Expenditures for Gas, Oil, Electricity - Lincoln Public Schools

1972-73 - Budget estimate 76-77

	Gas	Oil	Electricty	Total	% of 1972-73
1972-73	$173,903	$85,706	$307,688	$567,297	100%
1973-74	179,002	101,759	297,660	578,421	102%
1974-75	233,143	93,043	288,370	641,556	108%
1975-76	253,366	142,770	368,084	764,220	135%
Budget					
1976-77	300,00	160,00	480,00	940,00	165%

Dr. DEN HARTOG. The table presented shows dollars expended and estimates of expenditure for 1976-77. The data show that through 1975-76 expenditures for the three utilities increased only 35 percent and for 1976-77 the increase will be an additional 30 percent. One must note that no comparison is made as to square feet of buildings, severity of heating season, availabiity of uninterruptable gas and forced use of oil.

The point I wish to make is that since 1972-73 we have instituted every energy saving practice we can with funds available. However, for the 1975-76, 1976-77 years there is little or no reduction in usage and the escalating costs are having their budget effect.

Our next reduction will only be obtained with expenditure of money for renovation, monitoring devices, et cetera.

I do not believe the above data to be unusual. For I know that school business officials have made extreme efforts to reduce energy consumption. Our case is not extreme because of the controls, management principles and public support for good maintenance of buldings we have always had. In fact our relative burden, in comparison to other districts, may be light.

The point I wish to make is that many districts, ours included, in order to make further energy savings, are in need of professional and economic help. If a district had any latitude within its budget to institute energy saving techniques these funds have all been used to pay for the higher fuel bills that we have experienced in recent years.

Political actions indicate that business and industries will be given tax incentives for bringing energy conserving practices into play—that energy wasters will be taxed to benefit those who conserve.

It appears that unless legislation, such as H.R. 5996 is passed, that boards of education will have to increase local and/or State taxes to provide for the added energy fuel costs first, and then additional monies to insulate, renovate, remodel, and/or add energy saving practices.

However, H.R. 5996 approaches the problem with realism by making efforts to help those districts that try to help themselves with the greatest energy conserving practices. However, there appears to be a problem with those districts who may not be able, whatever the reason may be, to help themselves.

H.R. 5996 provides funds for demonstration projects which involve the development and use of energy conservation measures which show extreme promise, which can be moved from one district to another, and makes it possible for districts with inadequate staff and/or funds to see actual procedures in progress where they may reduce their costs by simple changes in management techniques.

H.R. 5996 provides for professional assistance to local districts, either singly or in consort with each other, to make specialized studies of building management practice and to conduct feasibility studies which are necessary.

In summary:

1. School districts are in need of new standards as to lighting, heating, air movement, insulation and fresh air which are established using today's energy concepts.

2. School districts need professional assistance in the field and on site as to evaluation of existing facilities to determine the best investments for energy conservation.

3. School districts need financial support to insulate, renovate, remodel and to install timing and monitoring devices to reduce consumption.

4. School districts need models to visit, demonstration sites where operation and maintenance personnel can see energy saving techniques and practices in operation.

5. School districts need models of data management systems to begin their own fact finding.

6. School districts need to organize instructional programs which actually involve teachers, pupils and parents into an energy conservation attitude.

In conclusion let us remember that the public schools have produced the best educated population on this earth and as a result, the highest standard of living, and, I am sure, they will again meet our national need by teaching about and implementing energy conserving practices.

We encourage your favorable consideration of H.R. 5996, or other legislation similar to it which will assist the elementary and secondary schools in this country in providing a model example of energy conservation practices.

STATEMENT OF E. C. GRAYSON

Mr. GRAYSON. Mr. Chairman, may I personally bring you greetings from your friends in Kentucky.

Chairman PERKINS. Thank you.

How long have you been the city school superintendent or the county school superintendent?

Mr. GRAYSON. Two and a half years, Mr. Chairman.

Chairman PERKINS. You have merged your schools for all intents and purposes down there, I am sure.

Mr. GRAYSON. We have merged, yes, sir.

Chairman PERKINS. So you really only have one school system now.

Mr. GRAYSON. That is correct, for the entire county.

Chairman PERKINS. In the entire county.

Mr. GRAYSON. We have, Mr. Chairman, 117,000 students. We are the 19th largest in the United States now. I might add that we have 170 schools, 5 central office locations, and over 12,000 full-time personnel.

Chairman PERKINS. Before you get into your statement, Dr. Grayson, I would like to ask you a preliminary question for you to think about as you go through your statement, because the increased cost of energy is a great concern to all of us.

Could you tell us how much the cost of energy has gone up for the Louisville public schools within the last few years, and also could you tell us how much more it cost to heat your buildings last year, due to our severe winter? Then, if possible, I would like you to estimate how many teaching positions these increases in energy cost have cost the Louisville school system.

Go ahead.

Mr. GRAYSON. I am prepared to address those questions, Mr. Chairman.

First of all, I would like to say—

Chairman PERKINS. For the Louisville taxpayer.

Mr. GRAYSON. Yes, sir. For the first 2 months of January and February, our fuel oil cost exceeded our budget by almost $1 million for 2 months. As you are probably aware, the Louisville Gas and Electric Company is our primary source of gas. However, the gas and electric company ceased providing gas for the months of January and February because of the severe shortage of natural gas, so our school system had to convert to standby oil. It was estimated that we would need less than 30 days, but that was extended to beyond 60 days, so therefore our fuel oil costs exceeded $1 million over our budget.

I think in terms of the fact that for 16 days our schools were closed in January and February because of the severe weather and road conditions—as you are aware, we have a very high transportation rate of our students throughout the county. In terms of cost, this had to affect our budget.

In my material there are two graphs, one of which I think would be very interesting to the committee and you can study these at your leisure. In 1965 to 1976 we were spending approximately 2.5 percent of our budget for fuel costs. Last year it was 4.2, and we estimate that in the current fiscal 1977 budget it will exceed 5 percent of our total budget.

If I could then look at it in terms of the pupils, because I think this is very imporant, our pupil costs in the past 10 years has risen over 400 percent from $12 per pupil to $54 and we are estimating at the end of the current fiscal year that will be approximately $70 per pupil for energy costs in our school system.

I could go on. For example, looking at many of the other fuel oil costs, of course I think another factor we are working with and which you are aware of is that our district is on a court order desegregation plan. We are using approximately 1 million gallons of gasoline per year in our overall transportation system of which a half of that is consigned to desegregation transportation. Our gasoline expenditures this past year were almost $600,000. This is up from $84,000 10 years prior to that time.

I think in terms of energy conservation I won't allude to that. I think Bob here has indicated many of the things that we are doing in our school system. One thing I would like to bring out is the fact that in Kentucky we are proud of the fact that we are one of the major coal producing States in the nation, and certainly we would like to consider conversion to coal for our heating units, but because of the fact that Harrison County is a high impact area in terms of pollution, the Environmental Protection Agency standards pretty well make it prohibitive for us to convert to coal for our heating units, so we are pretty well consigned either to natural gas or to standby oil.

We do have some schools, because of the natural gas embargo, that are only on electric, and now we are being told to cut back on the electric consumption as well, so this poses a real problem for a

school system. You convert to electric heating, and then you are told to cut back, and you have no other system of standby heating, and this could be very expensive in terms of trying to retrofit those schools to use some other alternate source of energy.

I would like to point out in terms of cost in our school system, I have proposed or reported to the board last week that there will be an $8 million deficit next year in our school system. We have approximately a $160 million budget at the present time. Much of this deficit has to be attributed to the high energy costs in our school system. The $1 million figure would provide almost 100 teachers in our school system, so this is the kind of thing we are talking about.

I have recommended to the board that 400 positions be eliminated in our budget next year to balance, and it will also be cut back in instructional supplies, in athletics, in terms of films, and other instructional programs that must be necessarily reduced because of inflation, because of energy costs and many other factors we are dealing with.

We would very strongly support, Mr. Chairman, the favorable consideration of H.R. 5996 as an aid to school systems in this country.

Chairman PERKINS. Your chart is horrible to look at. You show that in the 1966-67 school year, you were spending approximately $10 per student for energy, and this past school year it has gone up, if I read correctly, to approximately $70—

Mr. GRAYSON. That is correct, sir.

Chairman PERKINS. —per person per student for energy costs. That is up almost 700 percent in a period of 10 years in energy costs alone in your school system in the City of Louisville, in Jefferson County; is that correct?

Mr. GRAYSON. That is correct.

Mr. Chairman, energy costs are one of the fastest rising items in the budget that school administrators face.

Chairman PERKINS. This is a really serious problem at this time to my way of thinking, to see a jump of this kind, 700 percent in energy costs in 10 years, from $10 per pupil for energy up to $70 per pupil. Certainly we have got to have some legislation in Washington, and this has certainly got to be a part of the President's energy program. The schools are one of the big consumers of energy in this country, and we cannot overlook the ways to go about it to save money, to do it the most economical way. Something has to be worked out here for the school systems of this country.

Mr. GRAYSON. Yes, sir.

Chairman PERKINS. I never knew it was so bad until this morning. I knew we had had an increased cost, but I didn't know the increase had been 700 percent in a period of 10 years. That is almost staggering.

I put something in the record here a few days ago. Our nation's schools alone consume 11 percent of the heating-cooling fuel in this country. Yet it has been estimated that almost half of the energy they consume is wasted, mostly because school buildings were constructed in a very energy inefficient manner. In fact, the Federal Energy Administration has estimated that if 30 percent of the

nation's elementary and secondary schools were remodeled to become more energy efficient, we would save 25 million barrels of oil a year.

What is your comment on that proposal?

Mr. GRAYSON. Mr. Chairman, I don't think there is any question about it. I find myself in the same position as Dr. Den Hartog in terms of construction. Our schools were constructed with the idea of being as economically constructed as possible. The energy situation at that time was one of plentiful availability. We now, as you say, find ourselves with schools that have much glass space, which are very inefficient. We find heating plants that were not necessarily designed for most efficient use. There is no question in my mind that with the type of program that you are espousing here, that this can help conserve energy, and I would like to say that I think a side effect in addition, to energy conservation is the employment situation.

As you are well aware, Louisville is a high unemployment area, and some of the construction funds that are to be made available could help the unemployment situation as well.

Chairman PERKINS. In fact it is going to save the government money—

Mr. GRAYSON. No question.

Chairman PERKINS. —if we come up with a modernization construction program—

Mr. GRAYSON. That is correct.

Chairman PERKINS. —to do something about this situation, because of the increased costs of energy. The way the buildings were constructed at the time, we never dreamed of the energy shortage.

Mr. GRAYSON. Mr. Chairman, even with the past history, and this year, we know that we can experience additional cost increases in utilities next year, so we are looking at the situation as we are right now but we anticipate even higher energy costs throughout the years.

[The statement of E. C. Grayson follows:]

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Statement by
E. C. Grayson, Superintendent
Jefferson County Public Schools
May 3, 1977

It is a privilege for me to appear before this committee today and speak to you on the problems of our school district relative to the high cost of fuel, with particular reference to our need for emergency assistance as we deal with rising costs and the current national effort to conserve energy. I am enthusiastic in my support of HR 5996, which proposes to amend the Elementary and Secondary Education Act in order to provide some relief in this respect to local school districts.

School spending in the United States has outstripped inflation by a wide margin. Market Data Retrieval, Inc. conducts an annual nationwide survey of school district budgets and their most recent study shows that the average cost of educating a student in the nation's public schools increased 10% from 1974-75 to 1975-76.

The following quotation (which refers to the Market Data Retrieval Survey) is from the December/January 1976-77 issue of Spectator, published by the National Association of Elementary School Principals.

> The survey notes that educational costs have climbed by 55.6% since the 1971-72 school year, despite a decline in public school enrollments of more than 1.2 million students during the same period. In the 1975-76 school year, costs rose by an average of $115.31 per student, to a new high of $1,283.53.
>
> Some school spending highlights reported in the study were: instruction, up 9% over 1974-75; plant operation, up 22%; food services, up 9%; and employee retirement, up 10%. In fact, increased per pupil costs were reflected in every line item except current capital outlay, which, apparently as a result of declining enrollments, dropped 33% from 1974-75, or about $23 per student.

The Jefferson County Public school system, with an enrollment of 117,000 students, is the 19th largest school district in the

United States. We have 170 schools and five central office locations, including a 15-story downtown office building. We employ a staff of over 12,000 fulltime personnel. The school district is among the three largest employers in the Louisville metropolitan area and one of the leading consumers of energy.

Our district suffered serious financial losses because of the severe weather during the winter of 1977. For example, we expended $848,000 for fuel oil during the two months of January and February 1977 and this particular expenditure was double our budgeted costs for heating during the two month period. Further, emergency work on our physical plant to repair weather-related damages required overtime for personnel far beyond the budget for such contingency. Altogether, our added costs for the two month period exceeded a million dollars.

It should be noted that the increases in our expenditures for heating fuel are compounded in severe weather when we are forced to convert to oil. Our primary heating source is natural gas and our gas service was necessarily discontinued during January and February by the Louisville Gas and Electric Company.

Fuel oil costs during January and February would have been even greater if our schools had not been closed for 16 days, largely because of road conditions. When the schools were closed, we maintained "night cycle" on all heating units, keeping thermostats set only high enough to prevent freezing of equipment.

I am presenting herewith several graphs. Graph No. 1 illustrates Energy Cost as a Percentage of General Fund Expenditures in the Jefferson County Public Schools, 1966-67 through 1975-76. You will notice that our energy costs have risen from a low of 2.5% of the budget in 1967-68, to 4.2% in 1975-76.

Because of the severe weather this past winter, we are projecting this percentage of the budget to exceed 5% for the current fiscal year.

Graph No. 2, Total Energy Cost, Cost Per Pupil Per Year, indicates an increase of over 400% in this cost, from $12.05 in 1966-67 to $54.10 in 1975-76. This figure is projected to reach approximately $70 per pupil during the current fiscal year.

The other graphs submitted herewith (3-11) present line item analysis of the individual cost factors which are combined in Graph No. 2.

In addition to the budgetary problems incident to escalating heating fuel costs, the Jefferson County public school system faces ever increasing costs for gasoline. Our district presently transports over 75,000 pupils daily on 580 buses. (Over 20,000 of these pupils are transported in compliance with our Federal Court-ordered desegregation plan.) Our gasoline expenditure in FY 1975-76 was $588,680. Ten years ago this expenditure was $84,707.

The committee will be interested to know that we are addressing the energy problem in Jefferson County to the best of our ability with the resources available. In a comprehensive Plan of Action which I presented to the Board of Education on February 10, 1977, I included plans to develop additional guidelines for emergency operations, including procedures for energy conservation. Pursuant to this plan, we have completed a staff study outlining goals and activities designed to maximize the efficient use of energy in the school district. A copy of this staff study, entitled SavEnergy, is submitted herewith. It proposes district-wide training and outlines a program which includes an energy audit comparing costs at various facilities and the development of strategies to deal

with disparities between the various locations.

In Jefferson County, we are proud of the fact that Kentucky is one of the major coal-producing states in the country and we would like to consider conversion to coal for our heating units. Such action would be cost-prohibitive in Jefferson County at this time because Environmental Protection Agency standards for high impact areas require expensive equipment (i.e., scrubbers) to remove pollutants.

I am also enclosing a paper which was presented at the national meeting of the Association of School Business officials of the United States and Canada, in October 1976, by Mr. Lou Pawley, a member of our staff. This paper outlines the attention we are giving to the very serious problem of energy conservation.

We have studied the feasibility of a computerized central control system. The University of Louisville has installed such a system and is realizing a significant reduction in energy use. Our school buildings are widely dispersed but we have been advised by control companies that the central control operation would be practical for us and would result in substantial reduction in energy costs. We would welcome the opportunity to conduct a pilot operation, perhaps using a limited number of schools with high energy consumption. Automation of the heating and cooling units of buildings from a central location is an idea which large school districts such as Jefferson County should explore, and it is unlikely that this will occur without substantial federal assistance.

Our school district, like most organizations, did not really emphasize fuel conservation until the oil embargo and the subsequent national awareness of the critical nature of the problem.

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Since then we have initiated a number of end use procedures including the lowering of thermostats, efforts to reduce outside air entering our buildings, training programs for supervisors, and more careful monitoring of fuel use.

We have taken advantage of opportunities presented by new construction and major renovation to install energy-saving features such as thermopane glass, smaller and more efficient windows, improved insulation, updating of heating systems, and by reducing infiltration.

As we study the problem of energy conservation, we recognize that there are many things which we can do with resources which are presently available. These things are being done in a systematic way. But we also recognize that there are many things which will involve costly renovation and equipment and these things simply cannot be accomplished with local funds in the foreseeable future. Therefore, we have a keen interest in the provisions of HR 5996, which can provide technical assistance and basic grants for renovation with special attention to insulation, decreasing window areas, remodeling entrances to provide air-lock vestibules, and installing more efficient heat distribution systems.

Research has shown that windows present a special problem in energy conservation. Most of our school buildings were constructed before air conditioning was standard for school construction and we have a window-wall percentage of up to 40%. Regular window panes in such buildings cause serious heat loss. With the advent of air conditioning in school buildings, Kentucky guidelines for school construction were changed and there is no minimum requirement for window-wall percentage. It follows that some of our

buildings which now have air conditioning and considerable window space, can be made more efficient if we can reduce the number and size of windows. This is a single example of the way renovation funds could be used to conserve energy.

Federal expenditures for energy conservation will, of course, have a salutary effect in areas of high unemployment. According to the Office of Manpower Services, the five county Louisville Standard Metropolitan Statistical Area had an average unemployment rate of 6.4% during the first three months of 1977, with an average of 24,375 unemployed each month. Because of the unemployment rate, our school district qualified for $5.2 million in Economic Development Act funds this school year.

Assistance under the provisions of this bill can have a domino effect leading to a stronger instructional program. Federal funds used for renovation which saves fuel will, in turn, free local funds and reduce our per pupil energy costs. The reverse is true. Local funds which we had planned to use for instructional programs are now being diverted to maintenance and operations accounts because of budget overruns in these line items.

Our district faces an $8 million deficit for fiscal, 1978. While declining enrollment (which has reduced state aid), a lagging tax base and escalating costs have contributed to our dilemma, spiraling energy costs have also been a major factor. To reduce our deficit and prepare a balanced budget for next year, I have recommended the elimination of almost four hundred positions at all levels of school and central office staffing. Large reductions have been made in the budget for classroom supplies, athletics, films and other non-salary items.

It would be my hope that Congress will, at this time, give favorable consideration to HR 5996 and help local school districts address the urgent problem of fuel conservation.

Enclosures: (PLACED IN SUBCOMMITTEE FILE)

Chairman PERKINS. Go ahead, Mr. Lucas.

STATEMENT OF JOHN LUCAS

Mr. LUCAS. Mr. Chairman, I am John Lucas, superintendent of schools of the Kettering City school district, a suburban school district in southwestern Ohio.

I am pleased to appear today as a proponent of H.R. 5996.

Chairman PERKINS. Without objection, your prepared statement will be inserted in the record, and if you wish to summarize it you may. All the prepared statements will be inserted in the record.

[The statement of John Lucas follows:]

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H. R. 5996

EMERGENCY ASSISTANCE TO SCHOOLS ACT

Testimony Presented to

The Sub-Committee on

Elementary, Secondary, and Vocational Education

of the

Education and Labor Committee

United States House of Representatives

by

John T. Lucas

Superintendent of Schools

Kettering City School District

3490 Far Hills Ave.

Kettering, Ohio 45429

May 3, 1977

Mr. Chairman, I'm appearing today as a proponent of H.R. 5996 on behalf of the American Association of School Administrators.

I am Superintendent of Schools of the Kettering City School District, a suburban school district in southwestern Ohio. We have 12,200 students in twenty-one separate schools and are located in a metropolitan area contiguous to the City of Dayton. All of the buildings in our school district with the exception of two were constructed during the period from 1944-1969. In that sense we were in the mainstream of the post-war school growth that characterized much of our nation during those years.

Typically, these schools were constructed as one-floor buildings on slab, double loaded corridors with large expanses of glass or glass block on the exterior walls of each classroom. Roof construction was relatively simple, and minimal consideration was given to insulation. Mechanical systems were relatively unsophisticated with gas-fired boilers and zone control systems. The simple truth is that local boards of education were hard pressed to provide adequate school housing in face of enormous student growth; therefore, the primary goal during that era was to maximize the use of every available school construction dollar. As a direct consequence, the overwhelming majority of the school buildings which I've described are extremely inefficient consumers of heat energy. In my judgment, the majority of schools constructed nationwide during that twenty-five year period would share the same indictment.

The strength of that indictment was graphically demonstrated during the past winter in which we experienced the devastating combination of record-setting cold weather and a critical shortage of

natural gas. Schools throughout the country, and more specifically schools in southwestern Ohio, are still reeling from the economic impact of the residual building damage and overtime pay caused by buildings heated below levels of minimal maintenance during protracted periods of severe weather.

As the available gas supplies dwindled, the Public Utilities Commission placed schools in non-domestic allocation categories with business and industries. This procedure reduced gas quotas to 0% of the normal gas usage for some schools and percentages ranging from 15% to 50% for others. Not only did school buildings experience physical damage, but the disruption to the educational process for students produced irreparable harm. In my own school district, eleven school days were lost as a direct result of inadequate supplies of natural gas in addition to five days closed for severe weather. The impact on the continuity of learning for the 12,200 students in the Kettering Schools is immeasurable. That experience in varying degrees was shared by at least 139 of the 612 school districts in Ohio. State Department of Education officials are still attempting to accumulate data measuring the aggregate impact of the energy shortage upon the schools of Ohio during the past winter.

One study conducted by the Ohio Association of School Business Officials in January, 1977, estimated that the cost of closing (decommissioning) and reopening one 1000-student school building during severe weather as a result of a lack of adequate fuel would be $101,330.* Closing schools during periods of severe weather does

* "Complete School Building Shut Down Procedures Estimated on a 1000-Student Building," Ohio Association of School Business Officials, January, 1977. (See attachment.)

not seem to be either cost effective or educationally sound. Consequently, the only alternative that seems plausible is to embark upon an aggressive program of energy conservation.

In my judgment, the schools of this country are prepared to undertake that task with two distinct goals in mind: (1) to manage the critical shortage of heat energy sources available to schools as efficiently as possible, and (2) to provide a leadership model of energy conservation to the communities in which those schools exist.

H.R. 5996 contains the potential of becoming both the vehicle and the incentive by which America's schools can achieve those goals. While I'm not in a position to judge the adequacy of the amounts to be appropriated, I would urge that a detailed study of the scope of the need be undertaken after a commitment is made to the amounts defined:

Basic Grants[1]	$350,000,000	Each FY-1978-1981
Demonstration Projects[2]	$ 80,000,000	Each FY-1978-1981
Technical Assistance[1]	$120,000,000	Each FY-1978-1981

[1]Matching grants on 50-50 basis
[2]Grants on one-third to two-thirds basis

I stress that such a study be made after H.R. 5996 becomes law only to emphasize the need to expedite its passage. It is self-evident that the problems inherent in the energy shortage are both frustrating and complex. They are also nationwide in scope, and potentially catastrophic in consequences. I believe the bottom line of any energy policy must be the immediate and significant conservation

of our energy resources. H.R. 5996 is one means by which that goal can be approached, and I would urge that it be given a high legislative priority for prompt action by the House of Representatives.

Thank you.

John T. Lucas
Superintendent
Kettering City School District

COVER PAGE Item VI

OHIO ASSOCIATION OF SCHOOL BUSINESS OFFICIALS
750 Brooksedge Blvd. -- Westerville, Ohio 43081 -- (614)891-2215

J. E. BROWN
Executive Secretary

To: Members of the Ohio School Business Officials
Members of the Buckeye Association of School Administrators
Legislators

The Association of School Business Officials, in a continuing attempt to be of additional service to the school districts of Ohio, have prepared the enclosed advisory bulletin for your consideration. It is a suggested list of items to be tailored for each building in Ohio.

It must be realized at the outset, the uniqueness of each building and the multiplicity of circumstances must be given serious consideration in each district.

This advisory is an attempt to guide your planning in case of "calamity" of tremendous impact -- either "maintenance or moth ball."

Lead time is very significant. We cannot permit ourselves to be caught with "our Thermostats down" -- therefore, a detailed plan must be constructed to cover any eventuality with alternative spin-off for unique circumstances known only to you.

The potential damage to either building or expensive equipment can be of tremendous dimensions. The most detailed and sophisticated planning possible should be made to minimize these factors of extreme potential cost to the district and its physical plants and equipment.

We sincerely hope these efforts will be of assistance to you in your planning. There are members of the Ohio School Business Officials who have expertise in building maintenance. They are more than willing to share their experience and knowledge with you.

Sincerely,

J. E. Brown

Jack E. Brown
Executive Secretary

JEB:r
Enclosures

OHIO ASSOCIATION OF SCHOOL BUSINESS OFFICIALS
750 Brooksedge Blvd. – Westerville, Ohio 43081 – (614) 891-2215

J. E. BROWN
Executive Secretary

SHUT DOWN PROCEDURES

TO MAINTAIN BUILDINGS AT A MINIMUM TEMPERATURE

I. POTENTIAL PROBLEM AREAS

1. Bells, horns and buzzers if not turned off at the Master Clock.
2. Security alarms.
3. Fire alarms and smoke detectors.
4. Freeze ups.
5. Plumbing lines in exterior walls if not drained.
6. Outside air and exhaust air grilles if not covered.
7. Electric motors.
8. Sump pump.
9. Freezer and refrigerator.
10. Data Processing and other electronic equipment.
11. Fire extinguisher freeze ups.
12. Vandalism.

II. SHUT DOWN PROCEDURES PRIOR TO CLOSING

1. Clean total building.
2. Turn off all acet, argon, oxygen and propane valves.
3. Shut off gas to educational and food service equipment, i.e., lab tables, stoves, etc.
4. Hot water heaters should remain on (set temperature back to 100 degrees).
5. Hot water circulation pumps should remain on.
6. Vending machines should remain on, but contents should be removed.
7. Air compressors should be turned off and drained.
8. Close and lock all exterior doors; install chains and locks (make very tight) on all doors except the one entrance door.
9. Open classroom doors.
10. Close all windows and lock; re-check every window to be certain that it is locked.
11. Deliver extra replacement windows, window boards, bolts and locking strips to the building.
12. Close all window drapes, shades and blinds.
13. Turn off all lights except interior and exterior security lights.
14. All electric breaker panel doors should be left open.
15. In hot water heated buildings the circulating pump should be left on.
16. In electric heated buildings the radiant heat should be left on.
17. Check all back draft dampers to be sure they close properly.
18. Check attic dampers to be sure they close properly.
19. Remove all waste and garbage from building.
20. Turn on the security system upon leaving, if applicable.
21. Review security procedures to prevent unauthorized entry.
22. Reduce food inventory.
23. Remove all perishables that will not keep in excess of 10 days.
24. Remove pets, plants, fish, etc. from building.

Shut Down Procedures

25. Remove all monies from the building.
26. Do not remove telephones unless it is for more than 30 days.

III. DAILY OPERATING PROCEDURES

1. Building operators must call in to a designated official daily.
2. Arrange for daily building checks.
3. Maintain the building temperature so that it will not drop below 40° in the coldest area during the next 24 hours.
4. Check the temperature of the freezers and refrigerators. If freezer temperature rises above 20° or refrigerator temperature rises above 40° report this immediately to the designated official.
5. Check all rooms in the building for temperature, roof leaks, water leaks, fire, vandalism, etc.
6. Complete total vision check of the building exterior.
7. On steam heating systems, after you have shut the boilers down, be sure to operate the vacuum pumps on continuous cycle for a minimum of 15 minutes and then return to the float position.
8. Fill out a vandalism report for each case of vandalism and submit to the designated official.
9. Report all cases of vandalism immediately to the designated official.
10. Call the designated official for assistance or energy information (telephone number

IV. OTHER ITEMS OF IMPORTANCE

1. Personnel who are required to work:
   - Building operator - 4 hours per day, 7 days a week.
     - Recommended time (12 Noon to 4 P.M.)
   - Emergency Maintenance Personnel
   - Mail Services
   - Warehouse Deliveries
   - Payroll
   - Data Processing
   - Accounts Payable
   - Supervision
2. Negotiated agreements.
3. Notify the U. S. Post Office for a change in the mailing address.
4. Notify all vendors to withhold deliveries.
5. Notify truck lines for change in delivery address.
6. Notify United Parcel for change in delivery address.
7. Notify utility companies.
8. Notify all City Departments - police, fire, water, etc.
9. Notify security company.
10. Notify construction contractors who have contracts to complete.

Respectfully submitted,

THE ENERGY COMMITTEE
OHIO ASSOCIATION OF SCHOOL BUSINESS OFFICIALS
Robert V. Bullis, Chairman - Toledo Public Schools
Martin Brenbaugh - Washington Local Schools
John Lewis - Euclid City Schools
James Migliorino - Berea City Schools
Paul Stewart - Elyria City Schools

O.A.S.B.O. OFFICERS:
President - Walter F. Blaine
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Vice President - Ray Everett
Secretary - Robert V. Bullis
Treasurer - Marjorie Fenton

OHIO ASSOCIATION OF SCHOOL BUSINESS OFFICIALS
750 Brooksedge Blvd. – Westerville, Ohio 43081 – (614)891-2215

J. E. BROWN
Executive Secretary

COMPLETE SCHOOL BUILDING SHUT DOWN PROCEDURES

ESTIMATED ON A 1,000 STUDENT BUILDING

LABOR COST ESTIMATES AT $10 PER HOUR

School officials should be aware that the State Department of Education published a "Guideline for Closing Schools Due to Lack of Fuel" in January, 1974. Copies can be obtained from Columbus. The following materials are furnished as a supplement by the Energy Committee of O.A.S.B.O.

I. SHUT DOWN PROCEDURES AND THE ESTIMATED COST INVOLVED IS AS FOLLOWS:

1.	$ 5.00	Shut off the gas supply at the regulator.
2.	5.00	Shut off water at the curb (Utility Company).
3.	200.00	Compressor rental for 40 hours.
4.	40.00	Remove the water meter and drain it. Suck water from main line to curb box.
5.	800.00	Drain domestic hot water heating tanks. Note: Turn off fuel supply. Open the line at the furtherest point and several other pertinent locations and apply compressed air at 50 P.S.I. Blow the water back to the meter opening.
6.	100.00	Open all flush valves; remove cap disc and remove water - 50 valves.
7.	40.00	Open all sink faucets and block open - 20 units.
8.	100.00	Electric water cooler drinking fountains - unplug and remove drain plug from tank. Block hand valve open - 8 units.
9.	100.00	Open all regulators to drinking fountains and remove water - 20 units.
10.	100.00	Remove most of the water from sink P-trap; pour in one cup of ethylene glycol - 30 units.
11.	150.00	Remove most of the water from toilet P-trap in stools and urinals. Pour in one pint of ethylene glycol - 50 units.
12.	100.00	Floor drains - pour in one pint ethylene glycol - 20 units.
13.	10.00	Open exterior hose bibs - 10 units.
14.	10.00	Remove hot water circulating pumps and drain return lines - 2 units.
15.	20.00	Remove aquariums and drain - 2 units.
16.	40.00	Open and drain dish-washers pumps - 1 unit.
17.	40.00	Open and drain clothes washers pumps - 2 units.
18.	10.00	Open and drain booster heaters for dish washers - 1 unit.
19.	10.00	Open and drain steam jinneys from auto shops - 1 unit.
20.	10.00	Open and drain steam boilers on food service pressure cookers - 2 units
21.	300.00	Remove all fire sprinkler heads. Arthe furtherest point apply compressed air at 50 P.S.I. to remove water from the sprinkling system - 10 units.
22.	10.00	Drain water cooled refrigeration system - 1 unit.
23.	20.00	Drain water cooling tower and storage tanks from air conditioning system - 1 unit.
24.	50.00	Remove grease trap covers and install antifreeze - 2 units.
25.	100.00	Pump water from dilution sumps from Art and Science Rooms - 2 units.
26.	200.00	Pump water from clay traps and remove clay - 3 units.

Complete School Building Shut Down Procedures -

27.	$ 50.00	Remove water cutting oil from shop cutting machines - 5 units.
28.	40.00	Remove boiler mud leg plugs; open blow down valves and drain system - 2 boilers.
29.	500.00	Open steam lines and headers at their furthest point and apply compressed air at 50 P.S.I.
30.	500.00	Remove float traps, drain and leave disconnected - 50 units.
31.	100.00	Remove air vents on steam coils and drain - 24".
32.	10.00	Drain water from safety controls - 2 boilers.
33.	100.00	Remove feed water pump and drain - 2 units.
34.	20.00	Drain feed water receiving tanks - 1 unit.
35.	50.00	Drain vacuum pumps and tanks - 2 units.
36.	50.00	Drain heat exchangers - 1 unit.
37.	300.00	Drain radiant heat for under floor heaters and blow out with compressed air at 50 P.S.I. - 2 units.
38.	20.00	Drain expansion tanks - 2 units.
39.	1,000.00	Drain heating hot water loops and blow out with compressed air at 50 P.S.I.
40.	500.00	Shut off air compressors and drain tanks, filters and air lines. Flush system with nitrogen - 1 unit.
41.	10.00	Shut off fire alarm system, especially smoke detectors.
42.	10.00	Shut off clock and bell systems.
43.	100.00	Shut off gas to all educational equipment, lab tables, stoves, etc.
44.		Close and lock all exterior doors; install chains and locks (make them very tight) on all doors except one entrance door.
45.		Open classroom doors
46.		Close all windows and lock; re-check every window to be certain that it is locked.
47.		Deliver extra replacement windows, window boards, bolts and locking strips to the boiler room.
48.		Close all window drapes, shades and blinds.
49.		Turn off all lights except interior and exterior security lights.
50.		Open all electric breaker panel doors.
51.	100.00	Check all back draft dampers to be sure they close properly.
52.	100.00	Check attic dampers to be sure they close properly.
53.		Remove all waste and garbage from building.
54.	500.00	Cover all outside air and exhaust air grilles with plastic.
55.	50.00	Disconnect all acet, argon, oxygen tanks and install nitrogen in line.
56.	20.00	Shut off as many electric power panels as possible.
57.		Oil all shop equipment that will rust.
58.		Remove pets, plants, fish, etc.
59.	200.00	Remove water base paints, floor finishes and water based scientific supplies, etc.
60.		Remove all perishables that would freeze
61.	10.00	Empty vending machines and leave doors open.
62.	200.00	Empty refrigerators, freezers and leave doors open.
	$7,110.00	Possible cost involved for shuting down a school building.
		Estimated man hours = 700.

Some other areas of concern prior to shuting down a school building are as follows:

1. Notify the U. S. Post Office for a change in the mailing address or holding the mail at the Post Office. Some post offices will hold first class mail and parcel post for up to 30 days.
2. Notify all vendors to withhold deliveries or substitute a change of address.

Complete School Building Shut Down Procedures

3. Notify all truck lines who normally deliver to a school building, of a change in address.
4. Notify United Parcel Service of a change in address.
5. Notify all utility companies of the school closing.
6. Notify all City Departments of the school closing ..... police, fire, water, sewer, engineering, etc.
7. Notify security companies of the school closing.
8. Notify construction contractors who have contracts to complete.

In the event of a complete shut down, structural engineers, architects, utility companies, mechanical engineers, plumbing contractors and electrical engineers should be consulted as to potential major damages to the physical plant which might result or could be prevented. Some of the following items are of major concern: (1) roof failure; (2) parapet wall failure; (3) structural damage; (4) masonary damage; (5) twisted door and window mullions; (6) broken pipes; (7) heaved thresholds; (8) plaster and paint damage; (9) frost damage to interior footers; (10) wood floors buckling; (11) floor tile and carpeting coming loose; (12) ceiling tile or acoustic plaster damage.

The problems involved with reopening a school building can vary widely with the severity of the weather, age and construction of building, and length of shut down.

II. RE-OPENING PROCEDURES AND THE ESTIMATED COST INVOLVED IS AS FOLLOWS:

$ 14,220.00	Re-assembling systems (1,400 man hours).
5,000.00	Fire, theft, vandalism.
5,000.00	Electronic equipment and materials that have picked up moisture and other damage.
50,000.00	Major damage to physical plant
700.00	Replace 20% of T-stats - 10 units.
200.00	Replace 50% of flush valve diaphrams - 25 units.
500.00	Replace 15% of steam traps - 10 units.
15,000.00	Replace 5% piping and fixtures.
500.00	Replace 50% of steam valve discs - 25 units.
200.00	Replace 50% of smoke detectors that don't have resets.
500.00	Replace 10% of clocks, bells and P.A. systems.
500.00	Replace 10% of unit ventilator motors.
200.00	Replace paper damage.
1,700.00	Payroll for personnel who are required to work - supplemental contracts: warehouse deliveries, data processing, accounts payable, payroll, mail services for administration, emergency personnel. Minimum 2 hour building check, per day, per building.
$ 94,220.00	Possible re-opening cost.

$101,330.00 Total Estimated Cost for Shuting Down and Re-opening a School Building.

Respectfully submitted,

THE ENERGY COMMITTEE
OHIO ASSOCIATION OF SCHOOL BUSINESS OFFICIALS

Robert V. Bullis, Chairman - Toledo Public Schools
Martin Brumbaugh - Washington Local Schools
John Lewis - Euclid City Schools
James Migliorino - Berea City Schools
[illegible] - Elyria City Schools

O.A.S.B.O. OFFICERS:

President - Walter F. Blume
President Elect - Gail Fritz
Vice President - Ray Everett
Secretary - Robert V. Bullis
Treasurer - Marjorie Fenton

Mr. LUCAS. Thank you very much. I appreciate that.

I would just like to reinforce some comments made by my colleagues related to both the construction of school buildings, the present condition in which we find them, as well as something of the impact upon the education of students that we have experienced during the past year.

The school district that I represent I think perhaps serves as a model for the kind of construction that has occurred in a 25-year period beginning 1944 through 1969. The truth of the matter is that most of those buildings were constructed as one-floor buildings with slab construction, single-loaded corridors, very little opportunity or very little was given to insulating qualities of those buildings.

These buildings were built in an era in which we were primarily concerned with maximizing the availability tax dollars for school construction.

Boards of education were pressed out of shape literally to find adequate housing for students. However, that indictment, the indictment that schools across the country were built as poor users of heat energy is perhaps typical. In my judgment I think you will find the large majority of such construction exists across the United States.

I have no way of knowing the total number of schools that were constructed during that period of time, but I suspect it is a large majority of the schools that are presently being used.

We also found ourselves last year experiencing horrendous problems in terms of severe weather conditions. During the months of January and February in Ohio, school children were subjected not only to closure, which disrupted the educational process for many, many students, but also to actual conditions within school buildings on days which we were open which were not conducive to good education.

In my judgment I think the school administrators throughout the nation made a major commitment to managing the shortage. We found ourselves, along with virtually all school districts, subjected to fuel allocations in the same categories as commercial and industrial businesses, and as such, during those months we frequently were asked to operate on percentages of natural gas allocations which were as low as zero percent, which was virtually shut down, ranging from 15 to 50 percent, during weather conditions which were at least 30 percent more severe than typical. It is obvious that that dichotomy produced an almost impossible situation so far as learning was concerned.

I feel that there are at least 129 of the 600 school districts in Ohio that had similar experiences. So severe was the impact upon the schools in Ohio that the State Department of Education of Ohio does not yet have an adequate measure of how severe that impact really is. The disruption to the process of the continuity of learning was significant, and perhaps immeasurable.

In my judgment, I think that the schools of the country are prepared to achieve two distinct goals. One, we would like to engage in overt attempts to manage the critical shortage of limited heat energy sources that are available to schools and, secondly, to provide models within our communities for energy conservation

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projects. I think H.R. 5996 has the potential of providing the incentive by which America's schools can pursue these goals. It is self-evident it seems to me that the problems inherent in energy shortage are both complex and frustrating. They are nationwide in scope, and perhaps catastrophic in consequences. I believe that the bottom line of any energy policy must be the conservation of the available resources.

It seems to me that H.R. 5996 has the potential of utilizing schools to achieve that goal.

Thank you.

Chairman PERKINS. Let me just say this for all you gentlemen and the lady to comment on. The Administration's energy bill would have the governor of each State formulate a State plan for the remodeling of schools and hospitals to become more energy efficient.

Do you have any comments on this approach? $300 million is budgeted in the President's so-called "energy package" for this problem, and I am fearful if we don't do something in this area, that this bill or similar legislation will be referred to the committee that handles the entire energy pacakage, whether it would be the Interstate and Foreign Commerce Commission. It would seem to me to conserve energy, $300 million would just be peanuts insofar as formulating a program at the State level, to conserve energy in all the school buldings in the various States and all the hospitals.

Do any of you care to comment on it? Should we do it in a committee that has jurisdiction and that knows more about the school systems?

Mr. LUCAS. Mr. Chairman, my immediate reaction would be that the most effective and efficient use of such funds that might be available would be on a direct grant basis; that you are much more likely to get cost-effective use of those funds if in fact a system of direct grant could occur, something that is comparable to the bill in question.

Chairman PERKINS. As we have done in the past.

Mr. LUCAS. Yes, sir.

Dr. HANSEN. Mr. Chairman, I would like to urge that if it is at all possible, that people with educational interests act on this bill, and that it be maintained in your jurisdiction, because I think then we would have the interests of education well represented.

I have done a little pencil work, and it is my understanding, and I have no way to document this, but have been told that the hospitals would probably be using about a third of this, and of the remaining two thirds, higher education certainly would get a portion. Based on that kind of thinking, if the $300 million was fully funded, it would do about 7 percent of the elementary-secondary schools in the country. That is the public schools. I had not heard until today that it would include private schools.

If it was funded at about 60 percent, it would take care of about 4 percent of the schools in the country if you use a mean figure of about $40,000 to do a school, and I am using that based on what we found in our project. I heartily support what you are saying, that it is peanuts.

Chairman PERKINS. Do you have any further comment, Mr. Grayson?

Mr. GRAYSON. Mr. Chairman, I would just like to echo my fellow administrators here in terms of the direct grants. I think that would be a much better way to help us attack the problem. As Dr. Hansen was talking I was trying to make a mental calculation that in terms of the need in the State of Kentucky, I would estimate that would be insufficient to take care of our own needs in one State much less the entire country.

Chairman PERKINS. Let me thank all of you this morning. You have been most helpful to this committee and we are going to pursue it and do the best we can.

Dr. HANSEN. Thank you, Mr. Chairman.

Chairman PERKINS. Our next panel is Dr. Maxine Savitz, Director, Buildings and Community Systems, Office of Conservation, Energy Research and Development Administration; Mr. Edward Stephan, Deputy Director, Office of Energy Programs, Commerce Department; and Mr. David Bardin, Deputy Administrator, Federal Energy Administration. I would also like Mr. Thomas C. Schmidt, Commissioner of Education, State of Rhode Island, and Mr. John Adams, Director, Federal-State Relations of the Chief State School Officers to come around too, and testify after this panel.

Without objection, all the prepared statements will be inserted in the record.

Go ahead, Dr. Savitz.

STATEMENTS OF DR. MAXINE SAVITZ, DIRECTOR, BUILDINGS AND COMMUNITY SYSTEMS, OFFICE OF CONSERVATION, ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION; EDWARD STEPHAN, DEPUTY DIRECTOR, INDUSTRY/ASSOCIATION PROGRAMS DIRECTOR, OFFICE OF ENERGY PROGRAMS, U.S. DEPARTMENT OF COMMERCE; DAVID BARDIN, DEPUTY ADMINISTRATOR, FEDERAL ENERGY ADMINISTRATION, ACCOMPANIED BY, MICHAEL PULSCAC, OFFICE OF CONSERVATION AND ENVIRONMENT, FEDERAL ENERGY ADMINISTRATION; THOMAS C. SCHMIDT, COMMISSIONER OF EDUCATION, STATE OF RHODE ISLAND, VICE CHAIRPERSON, COMMITTEE ON LEGISLATION, COUNCIL OF CHIEF STATE SCHOOL OFFICERS, ACCOMPANIED BY: JOHN ADAMS, DIRECTOR, FEDERAL-STATE RELATIONS, COUNCIL OF CHIEF STATE SCHOOL OFFICERS

Dr. SAVITZ. I am pleased to have the opportunity to talk to you about the research, development and demonstration programs that ERDA is involved in that relate to more efficient use of energy in educational facilities.

ERDA's conservation program is really involved with more efficient use of energy through technology development and also to encourage the option for fuel switching.

Major elements of the conservation program include efforts to—

Chairman PERKINS. Without objection, all of your prepared statements will be inserted in the record and if you care to summarize, please do it.

Dr. SAVITZ. The building sector consumes about a third of the nation's energy and this is equal to 12 million barrels a day

equivalent. The educational facilities represent about 12 percent of the total energy used in commercial buildings. This is equivalent to about 1.14 per billion BTU a year. On a per square foot basis this is 200,000 BTUs per square foot per year, which is not the most energy inefficient types of buildings using the most. Hospitals and restaurants, for example, consume more on a square foot basis, but the cost of fuel for educational facilities has grown rapidly. For example, the average cost in energy in 1972-73 was about $20 per pupil. In 1975-76 the projected cost is about $38 per pupil.

In the past year we have been trying to identify what would be the most appropriate targets for looking at research, development and demonstration activitites in educational buildings. We assembled an ad hoc task group which consisted of members of ERDA, FEA, Department of HEW, Department of Commerce, and also people from the National Education Association, the Association of School Administrators, the Association of Physical Plant Administrators, Educational Facility Labs and the private sectors and we came out with sort of a research agenda, what items should be addressed. Particularly what is needed is some good data and some good cost-effective means of what can be done in existing facilities.

Also identified in university complexes things like laboratories and gymnasiums and medical facilities were very large users of energy. There is a problem with various codes that are conflicting and administered in different ways, cost problems particularly in regard to ventilation standards, because a difference in energy inefficiencies.

There is a difference in needs and requirements of primary and secondary facilities as opposed to university facilities.

As a result of this and the various priorities we are embarking on some research activities this year and in the next fiscal year. FEA, which you will hear about from Dr. Bardin, has been looking at 10 schools, doing some audits of these schools and applying their computer program to them, suggesting retrofit measures. We plan to utilize these same 10 schools and instrument them thoroughly so that we get some good data as to how energy is used for the heating system, the lighting system, what it is doing to the air quality, and then we are going to help pay for the cost of installing these along with the various school sectors for various retrofit actions, and measure each individual action, so that we will be able to really get good data on what actions save the most energy and what the costs of these are.

These instrumented buildings will also serve as laboratories for us to try the new technologies that are coming on, such as fuel cells and gas-fired heat pumps, which will save energy more efficiently.

In the university phase of the program, we are going to be looking at the most energy consuming sectors of these which I mentioned, the laboratories and gymnasiums, and will be going out with competitive procurement to look at these.

The energy savings in universities and higher education cost more to implement often, but you can often do more. You can accomplish savings in the 40 to 50 percent range. All activities are working closely in addition to the other agencies, working with the School Administrators Association and the physical plant adminis-

trators, which will aid the technology transfer from what we learn in the 10 schools and in the universities and other types of schools.

We have been tracking what higher education groups have been doing on their own; and how they have been very significantly increasing energy use. In Ohio State the university has retrofitted seven buildings and instrumented them and found that the savings were 30 to 40 percent of the energy used in previous years and everything paid for itself in less than a year. Of interest, there is the fact that they didn't really choose insulation as a method for energy savings, but did modifications of mechanical systems, replacement of boilers, chillers, and attacked the ventilation system.

This information is being gathered and disseminated.

I would like to just conclude that we see various technical needs regarding energy education facilities. There needs to be guidelines based on actual field data, to really select the best retrofits for energy conservation, and they should be simple to use, inexpensive, and give accurate performance and economic costs.

There is a need for uniform codes and standards so that consistent construction renovation planning practices with efficient use of energy in mind can be used.

There is a need for good design requirements for various mechanical systems, and that the situations that universities and schools face may be quite different and are quite complex.

I would like to note that the Administration's proposal, which was transmitted to Congress and discussed in the previous panel, will address the retrofitting and providing opportunities for education facilities, and that there are similarities between H.R. 5996 and the Administration's approach.

The Administration's approach, however, is broader in scope, and will provide assistance for a wider range of institutions. Consequently, we think that is the preferred route.

I would also like to state that ERDA is already funding demonstration programs in the expanded Carter budget in this area, allowing us to proceed along those lines.

[The statement of Dr Savitz follows:]

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STATEMENT OF

MAXINE SAVITZ
DIRECTOR
DIVISION OF BUILDINGS AND COMMUNITY SYSTEMS

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

BEFORE THE

SUBCOMMITTEE ON ELEMENTARY AND VOCATIONAL EDUCATION

OF THE

COMMITTEE ON EDUCATION AND LABOR

MAY 3, 1977

STATEMENT BEFORE SUBCOMMITTEE ON ELEMENTARY

AND VOCATIONAL EDUCATION COMMITTEE ON

EDUCATION AND LABOR

May 3, 1977

Thank you for this opportunity to present technical input from the Energy Research and Development Administration (ERDA) for the proposed bill to provide Federal funding assistance to promote the use of energy conservation techniques in existing schools, colleges and universities (HR. 5996). The bill proposes a grant program to accelerate the use of commonly accepted methods to save energy with three distinct phases: (1) a basic grant for energy conservation measures, (2) a demonstration program of innovative energy conserving technologies, and (3) a technical assistance program.

ERDA has been playing a significant role in the conservation arena. Conservation is a matter of particular interest and importance because it represents a major short term means of meeting our energy requirements. The Federal Non-Nuclear Energy Research and Development Act (P.L. 93-577) cites as a first governing principal that energy conservation should be a primary consideration in the design and implementation of the Federal non-nuclear energy program. ERDA's research, development, and demonstration programs are, I believe, faithful to that principle.

Major elements of the ERDA conservation program include efforts to reduce energy consumption in buildings through more efficient space conditioning and utilization of waste heat, to achieve greater efficiency in processes used by energy intensive industries, to assist in the development of technologies for converting waste to energy or synthetic fuels and to exploit potential energy savings in transportation by demonstrating alternative engines and energy conserving accessories. Each of these research efforts work to enhance the energy use efficiency.

In Fiscal Year 1977, the Division of Buildings and Community Systems in ERDA began a research, development and demonstration program for energy conservation in educational facilities. The approximately six billion square feet of educational facilities presently consume about 1.15 Quads annually (200,000 BTU/SQ.FT./YR). This represents about 12% of the total energy use in commercial buildings. It should be noted that on a square foot basis, these buildings are not the most energy intensive in the sector. However, since 1972-73, energy costs for elementary schools have risen from an average $19.81 per pupil to $37.94 per pupil in 1975-76. Because the nature of the school budget is nondiscretionary, and due to State and locally legislated debt limitations (between 70-90% of overall budget is for salaries), these increased costs have had a significant inpact on educational programs. The severity of this past winter also illustrated the problems facing schools and universities with the temporary closing of many institutions due to lack of fuel; over 40 million pupil days were lost in 13 states.

In order to identify and answer the needs of both schools and universities, an ad hoc Joint Committee of Energy Conservation in Education Facilities (JCECEF) was formed at ERDA's initiative. Members of this Committee include ERDA, the Department of Health, Education and Welfare (Office of Education, Office of Secretary), the Department of Commerce, the Federal Energy Administration (FEA), various national education associations, and architectural and engineering technical societies.

Some of the initial observations of the JCECEF are summarized below and represent the priority areas the ERDA program is attempting to address:

(1) Schools typically have a lack of "on staff" technical expertise regarding the selection of appropriate retrofits of existing school buildings. As a result, energy conservation actions are scattered and indecisive. School administrators have an urgent need for fundamental data and for inexpensive selection techniques to assist them in deciding upon optimal conservation measures which will save maximum energy at minimum cost.

(2) Laboratories, medical facilities, and gymnasiums are generally the most energy intensive of all campus buildings because of code requirements for large volumes of fresh air ventilation in those buildings.

(3) Various, and often conflicting, currently administered codes and standards have confused and inhibited the practice of energy conservation in educational facilities. A preliminary study performed for ERDA confirmed the presence of a large array of conflicting codes, standards, rules, and regulations imposed by public agencies and private groups which cause excessive energy consumption. This study was conducted in six states for the JCECEF by the American Association of School Administrators (AASA) for schools and the Association of Physical Plant Administrators (APPA) for universities.

(4) There is a distinct separation of many needs and requirements between schools and universities, in terms of level of technical expertise, number and use of buildings, and budget elasticity. Common ground includes the lack of uniformity and reasonableness of ventilation and lighting requirements and the urgent need for demonstrated experience with retrofits particularly in priorities, performance and costs.

In order to begin addressing the problems outlined in item (1), the FEA, through contracts with the AASA and the Educational Facilities Laboratories (EFL), selected 10 schools in the U.S. to be retrofitted to conserve energy and reduce fuel costs. The object was to: (1) determine the potential impact of conservation measures in this type of building, and (2) determine if an inexpensive computer program could be utilized and verified to determine whether a school building was consuming more energy than its design anticipated. The computer program developed for FEA provides a calculated annual energy usage which can be compared to actual energy usage. If actual energy usage appears excessive, it is assumed that operations and maintenance levels are inadequate for the facility. The computer, therefore, provides a valuable tool for the school administrator to initiate a no-cost conservation program by improving the operations and maintenance of his or her facility. At the present time, the computer program is not capable of providing a detailed energy analysis for selection of specific retrofits which may require an investment. In this area, ERDA is currently developing a comprehensive computer program which is very site-specific and incorporates performance and economic analysis. For each of the 10 selected schools, in the FEA project, architectural and engineering firms identified specific retofit measures. Prior to any actual retrofit, the FEA involvement will now end. Through funding arrangements and time schedules have not been finalized, discussions with ERDA have indicated the possibility for ERDA financed, participation in the installation, instrumentation and monitoring of the schools in the pilot retrofit program. In the pilot program, monitoring prior to retrofit is desirable in order to obtain an evaluation of the effectiveness of each modification. In this manner, it is anticipated that we will be able to develop actual field data as a quantitative resource which school administrators can use in selecting their own retrofits and convincing the taxpayers of it to raise the capital through local bonding procedures. At the present time, only about one of three energy related bond issues is passing.

It is also planned to use these buildings as test facilities for new technologies. The expected completion date of this 10 school project is scheduled for the end of the 1978 calendar year or early 1979.

A similar RD&D program is planned for universities. This program will concentrate on the special generic characteristics of such facilities. Since universities often incorporate highly diverse functions in a single building and since many buildings may be served by a single heating/cooling plant, the technological problems in practicing energy conservation are complex and often expensive. A retrofit program for universities is expect to begin before the end of FY 1977. It will emphasize special buildings (laboratories, gyms, etc.) and in particular will examine at least the following:

(1) An investigation of the ventilation requirements for laboratories, gymnasiums, and other buildings which are unique to university campuses. Field verification of any revised ventilation recommendations will also be initiated.

(2) An investigation of campus network systems with an emphasis on incorporating thermal storage. For FY 1978, there is also planned work on a coal-burning co-generation plant to be undertaken by ERDA at Georgetown University.

(3) A feasibility study of a zonal approach to campus-area energy usage, so that off-peak or between-quarter energy usage can be minimized.

This program is potentially larger in dollar cost per building because there are greater retrofit funding options available to many large universities. Waste heat recovery systems, total energy systems and other expensive equipment are applicable at the university level but not for lower education. Energy savings are expected in the 40-50% range for each retrofitted university building.

As the work in these schools and universities may lead to new recommended ventilation requirements and design guidelines, integration of new energy-conserving requirements in the present educational system will be necessary. It is planned that the preliminary groundwork in this area performed by the AASA and the APPA will be extended to cover all states in greater detail. One expected result will be the development of a consistent construction/renovation planning and building process, which is presently characterized by many vague and conflicting ad hoc approaches. There have been significant non-Federally sponsored activities in energy conservation programs, particularly at the university level. In 1973, The Ohio State University in Columbus, Ohio embarked on an energy conservation program using in-house funding with the expectations of an average of 20% energy savings in each building. Of the sixteen million square feet of Columbus campus buildings, approximately 35 buildings representing 3.5 million square feet have been investigated. To retrofit these buildings, total material and lab. costs are estimated at $986,000 and the architectural and engineering servies have cost $500,000 for a total investment of $1,486,000 (or 43¢/sq. ft.). Anticipated annual energy savings is $1,380,000 for a payback just over one year. Actual retrofit has been completed in 7 buildings as of July 1976, averaging 30-40% energy savings and the investment is paying out in less than one year. In one building, the Allied Medical Facilities savings of 70% natural gas and 40% electricity have been achieved. Other universities such as MIT, Princeton, Michigan State and Rensselear Polytech Institute have also conducted well-managed energy Conservation programs.

These savings have been accomplished through the use of a variety of energy conservation measures. Operations and maintanence items such as tuning of boilers and air-conditioning equipment, rescheduling of classes, and reduced thermostat settings have accounted for about 10% savings in schools and universities. The remainder of the savings can be accrued to actual hardware modifications such as reduced lighting levels, reduced fresh air ventilation, changes in mechanical systems and replacement of boilers and chillers. It should be noted that no added insulation was installed on the Ohio State campus in its entire conservtion program. All energy savings were accomplished through mechanical and lighting system changes or through improved operations and maintanence. One of the problems with these university programs is that the criteria for implementation of retrofits has been a two or three year payback. Due to conservation estimating procedures, many potentially significant retrofits have failed to be installed. Examples include heat recovery systems, total energy system and central campus computer control systems. .As previously stated, we hope to prove thae systems may be good investments through more accurate calculating procedures and demonstration, and through the use of life cycle costing for decision making.

Due to the fact that ERDA already has authority to do research, development and demonstration work in schools and due to the proposed Carter FY 1978 budget which provides funding for this area, we do not feel separate legislation for demonstration is necessary. We feel that it is necessary that demonstration be an integrated program for all buildings and are pursuing this as legislated in the Non-Nuclear Energy Research and Development Act. Demonstrations may be particularly beneficial for schools since the level of energy expertise in the energy and engineering field. Colleges and universities are in better shape, due to engineering and/or physical plant departments; however, many physical plant administrators urgently need more technical data regarding high technology energy saving systems. The nature of the ERDA education facilities demonstration program is to incorporate both known and innovative technology to provide documented results which will aid the educational field community.

The ERDA program plans to retrofit and monitor 10 schools (at a level of about $750K total) and 3-5 university buildings (at an anticipated $500K Government and $500K private cost). It is our opinion that this initial level of demonstrations should satisfy the immediate needs of both school and university decision makers. It is, terefore, our recommendation that the additional legislation for demonstration as proposed in H.R. 5996 is unnecessary.

In summary, I would like to point out the following technical needs, problems, and observations concerning educational facilities in regards to energy:

(1) A need for guidelines based on field data in order to select retrofits for energy conservation. These guidelines must be simple to use, be inexpensive to use, and provide accurate results in both performance and economic areas.

(2) A need for uniform codes and standards so that a consistent construction/renovation planning process can be utilized.

(3) A need for realistic design requirements in the areas of ventialtion and illumination.

(4) Costs and problems facing schools and universities are quite different. Universities are far more complex, yet have greater potential for energy savings.

(5) Complete retrofit costs are ranging from $0.40 to $1.00 per square foot of floor space for items with less than a 3 year payback period. The use of life cycle costing will allow more retrofit options to be incorporated at a higher cost estimated at $0.80-$1.50 per square foot.

(6) We feel that the importance of energy conservation in educational facilities should maintain a high priority and are pursuing a program intended to lead towards its implementation.

In closing I would like to note that the Administration's proposal in this area was just transmitted to Congress as Title I, Part C, of the National Energy Act. While there are similarities between H.R. 5996 and the Administration's proposal, I favor the latter approach, because it has a broader scope and provides assistance for a wider range of institutions. It also would not duplicate the demonstration projects now being funded by ERDA.

Mr. Chairman, I would be pleased to answer any questions you may have.

Chairman PERKINS. Thank you.

The next gentleman. Identify yourself for the record.

STATEMENT OF DAVID BARDIN

Mr. BARDIN. Mr. Chairman, I am David J. Bardin, the Deputy Administrator for the Federal Energy Administration.

It is a great honor and a privilege to appear before this distinguished committee.

I want you to know that this is my first appearance before a congressional committee since taking office.

I am accompanied by Mr. Michael Pulscac of the FEA, Office of Conservation. He undoubtedly will be able to add to the information if I have the opportunity to turn to him.

It is especially important to appear here today because of the important work of this committee. I come from a family of educators. My late father was an educator. My mother is a retired school teacher, so I personally appreciate the kind of work that this committee has done over the years and is setting out to continue to do in the years ahead.

I come to you from 3 years in State government in the Office of the Commissioner of Environmental Protection of the State of New Jersey, but I am coming back to Washington after a break of several years. I used to work here until 1969.

I have a prepared statement which I understand is in the record. I will just highlight it.

Chairman PERKINS. Without objection, it will be inserted in the record.

[The statement of David Bardin follows:]

********** Insert I **********

STATEMENT OF

DAVID J. BARDIN

DEPUTY ADMINISTRATOR

FEDERAL ENERGY ADMINISTRATION

BEFORE THE

SUBCOMMITTEE ON ELEMENTARY, SECONDARY

AND VOCATIONAL EDUCATION

OF THE

COMMITTEE ON EDUCATION AND LABOR

U.S. HOUSE OF REPRESENTATIVES

MAY 3, 1977

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Mr. Chairman and members of the Subcommittee, I welcome this opportunity to discuss with you the scope of the problem schools are facing with respect to energy, and some of the actions the Administration has taken or proposed to assist schools in making their buildings more energy efficient.

The national energy plan, as outlined by the President in his address to the Congress on April 20, places first priority on the establishment of an effective national conservation program. Those components of the plan directed at furthering energy conservation are designed to achieve the President's goal of reducing the average annual rate of increase in energy demand to below 2% per year. The achievement of this goal is essential if we as a Nation are to avoid the serious economic and political disruptions that could result from future interruptions in supplies of oil or natural gas or from radical increases in the world prices of these fuels.

Although it is impossible to predict the future with complete confidence, we have concluded that there is a significant possibility that world demand for oil and natural gas could exceed production capacity by the late 1980's or early 1990's--much sooner than previously predicted. Should this occur, substantially higher world prices for oil would result and the severity of any shortages and supply interruptions

would worsen. Because it takes many years to change the patterns of energy use and supply that have been developed over decades, we must act now to conserve and at the same time shift toward more plentiful and, eventually, renewable supplies of energy.

As you know, virtually all sectors of the economy are affected by the national energy plan. Specific proposals are included in the plan to encourage or require energy conservation in residential and commercial buildings, industry and automobile transportation, among other end-use sectors. The provisions of the President's legislative proposals are now before the Congress.

With respect to the buildings sector, the President is committed to the expeditious development and implementation of the energy conservation performance standards for new residential and commercial buildings authorized by the Energy Conservation and Production Act (P.L. 94-385). The President has also proposed tax incentives to encourage building owners to make energy conserving investments in existing buildings. These actions are based not only on the conclusion that a reduction in the demand for energy is essential for the national welfare, but also on the fact that significant energy savings can be achieved in both new and existing buildings through the implementation of a wide range of cost-effective energy conservation measures.

Because non-profit institutions, which have been particularly hard hit by rising energy prices and shortages of natural gas, would not be able to take advantage of the proposed tax incentives, the President has taken steps to provide them with direct financial assistance for energy conservation investments in existing buildings. Specifically with respect to public and non-profit schools, colleges and universities, and hospitals, the President has proposed a 3-year, $900 million program of Federal grants to States to provide 40% of the funding for energy saving capital improvements made to existing buildings. For other buildings owned by State and local governments, the President has directed that funds provided by the Economic Development Administration for public works projects be made available for energy conserving capital improvements as well. I will discuss briefly the proposed grant program for schools and other institutions later in my testimony, but will concentrate on the analyses FEA has undertaken to determine the potential for energy conservation in school buildings and the methods that schools could utilize to identify and implement measures to achieve this potential.

Increasing energy costs and shortages of natural gas have adversely affected all sectors of the U.S. economy, but have probably hit the educational community

harder than almost any other sector. Operating as they do on fixed budgets, the public schools are experiencing much difficulty in absorbing these increases. In many cases, school administrators are being forced to curtail educational services in order to pay for the energy they consume. During the past winter, over 40 million pupil days were lost in 13 States due solely to fuel shortages, and it is estimated that only about one-third of these lost days will be made up.

There are over 16,000 public school districts in the United States with approximately 85,000 school buildings (60,000 elementary and 25,000 secondary). The plight of our public schools resulting from increased fuel costs became apparent following a national survey of school district fuel costs and consumption. The survey, which was conducted by the Federal Energy Administration, used data supplied by a statistical sample of 498 school districts selected to represent the Nation as a whole. The results are enlightening. I would like to cite several significant statistics developed by the survey:

* The Nation's public schools spent an estimated $1.5 billion for fuel during 1974-75. This is $514 million more than they spent in 1972-73. As one measure of comparison, that represents about 43,000 teaching positions at current salary rates.

- Oil-dependent regions have been particularly hard hit by price increases. For example, in New England the median expenditure for oil--the major heating fuel--increased 136% from $11.23 per pupil to $26.45 between the two school years studied despite the fact that consumption was cut almost 8%. In New York and New Jersey, median costs for oil rose 126% on a per pupil basis, while use of oil decreased 15%.
- Gas-using regions of the United States were the least hard hit by increased fuel costs (ranging around a median increase of $5 per pupil), though some districts found themselves limited in the amount of fuel that was available.

There are two essential steps that can be taken by school systems to save energy. The first step is to survey existing buildings to determine how much energy they use and to identify and adopt energy conserving operating modifications. These conservation measures do not require major capital investments and can save as much as 30% of the energy used in an average school building. The second step is the implementation of capital improvements which increase the overall energy efficiency of the building. Such capital improvements can be expensive, but would normally result in the realization of an additional 15% reduction in energy use. The resulting dollar savings would more than offset the costs of the initial investment.

Although implementing such a conservation program could save millions of dollars a year, only a small percentage of all schools have taken action. There are two major reasons why conservation measures are not being implemented. First, a general lack of technical expertise has made it particularly difficult for school systems to take effective actions to conserve. Second, it has often been difficult for schools to obtain financing for major capital expenditures to improve the thermal efficiency of school buildings. For public schools, financing is often not possible without additional bond referenda, which have normally resulted in substantial time delays and have often been rejected by the communities.

The Federal Energy Administration has initiated several efforts to help schools obtain the technical assistance necessary to initiate a conservation program. With respect to the financing of capital improvements, the President's proposal for Federal grants to States for this purpose would provide 40% of the cost of such projects.

Over the past two years, FEA has provided information and assistance to schools through workshops, conferences, publications and energy audit methodologies to help them realize the potential savings. In each case, FEA's role has been to develop and demonstrate these materials. We expect State govenments, supported in part with funds from FEA, to make available these workshops and materials to schools. Specifically, we have undertaken four major efforts in these areas.

The first is the Public Schools Energy Conservation Service. By taking advantage of recent advances in engineering and computer technologies, the Service is able to establish energy use guidelines for electricity and fuel for most public school buildings. These guidelines take into consideration such factors as climate, pattern of use, and special physical characteristics of the facility. By comparing the actual use with the guideline, the building's potential for both energy and dollar savings is determined.

The Service has been designed to work interactively with school and district staff members, and provides modification information on two levels. At the operating level, the Service's self-audit program provides general suggestions for bringing the building's energy use down to guideline levels with little or no expenditure.

At the second level, capital modifications requiring larger investments are analyzed, using simple life cycle cost procedures to obtain a selection of cost-effective modifications specific to each school. This computer analysis is intended to indicate those modifications that have sufficient merit to justify the employment of professionals to carry out a detailed engineering analysis.

In the first phase, data supplied by questionnaire from the school district concerning the building's age, type and energy consumption patterns is run through a computer and compared with a "guideline school" (an energy efficient model of that type

school). The results of the comparison are returned to the district, along with general suggestions on how to increase the building's energy efficiency. The capital modifications phase is operated much the same way, with additional information supplied by the district and more detailed suggestions provided by the Service in the area of actual building retrofit. Based on research, development, and tests conducted by the Educational Facilities Laboratories, Inc., involving more than 1,500 schools over a two year period, it is indicated that average savings of up to 30% can be achieved through the full implementation of operations and maintenance modifications. The savings were found to be possible in 85% of the 766 schools sampled. It is further estimated that, once the operational changes have been implemented, additional savings of 15% are possible through capital modifications that would save sufficient energy to pay back the cost of the investment in 12 years or less.

The Service is now operational for elementary and secondary schools. Under provisions of the Energy Policy and Conservation Act and the Energy Conservation and Production Act, FEA is making the Service available to all States for implementation. At this time, approximately 40 States have expressed interest in incorporating the Service in their State Energy Conservation Plans.

We are recommending this type of energy audit be used on all school buildings in the United States as a first step in undertaking an energy management program.

The second FEA project involved the development of an On-site Energy Survey procedure. The on-site survey, or mini-audit, is recommended for use on at least those buildings in each school district where energy analysis reports produced by the Public Schools Energy Conservation Service indicate reasonable energy savings potential.

The mini-audit, developed for FEA by the Minnesota Energy Agency provides a more detailed analysis of a facility's energy use. Mini-audits are one or two hour audits that are conducted by individuals or teams of specialists who walk through a facility observing and analyzing the building's structure, systems, operations and maintenance practices and other factors that affect energy consumption. Two major areas of possible energy savings receive special attention: measures that can be implemented quickly at little or no cost (usually in the operations and maintenance area) and retrofit possibilities that would require some small capital investment. While both the Service and the mini-audit emphasize operational improvements, the mini-audit recommendations are specific to the building being surveyed.

The ideal mini-audit team is made up of an experienced engineer, a representative of the school's utility company, the chief operating engineer for the building, and one or more administrators from the school district. In its walk-through inspection, the team takes careful note of the building type, age, and state of repair; lighting system; heating, ventilating, and air-conditioning

system and so forth. Upon completion of the audit the team provides the school administrator with a report on the conditions found and recommendations for changes in operating and maintenance procedures, building components and instrumentation that should result in energy savings. Our studies indicate that implementation of the measures recommended in most mini-audits will lead to savings of 20 to 30%.

The third program I would like to mention is the detailed engineering analysis. This type of energy audit (maxi-audit) is used mainly for buildings with patterns of consistent and abnormally large energy use and is the most intensive form of energy analysis available. A fairly new procedure, it involves a complete, in-depth energy study conducted by an architectural-engineering firm and should include a detailed description of the building's energy use patterns, a calculated energy budget for the building, the fuel and cost savings that would result from recommended changes in operations and maintenance procedures, and the fuel and cost savings--with estimated payback periods--that would result from each recommended capital investment.

Currently, FEA is involved in a five-phase demonstration project with the American Association of School Administrators (AASA) called "Saving Schoolhouse Energy." Dr. Shirley Hansen who testified earlier, directs the project for AASA. She discussed the program in her testimony, and I would like to elaborate on it further. FEA has funded maxi-audits of one elementary school in

each Federal region. These audits will be completed in May 1977.

This project is designed to produce hard data that will clearly show the desirability of renovating school buildings for energy conservation. After completion of the maxi-audits on each of the ten schools, specifications will be drawn up, and the recommended changes and building modifications will be implemented by funds made available through the private sector. Following the modifications, each building's energy use will be monitored and data on the energy reductions achieved will be disseminated. The Energy Research and Development Administration will participate in the energy monitoring phase of the project. AASA is conducting the project with FEA funding for the first phase (maxi-audits). FEA will then serve in an advisory capacity throughout the remaining phases.

Preliminary results of the project indicate that the cost of capital modifications with a payback of 12 years or less average about $25,000 for elementary schools or about $.62 per square foot. The cost of these improvements is estimated to be around $75,000 for secondary schools, about the same as elementary schools on a square foot basis. Within the above constraints, it is believed that about 50% of the Nation's public school buildings could justify capital modifications.

The last of our activities that I would like to mention is a series of workshops for public schools. During the fall and

winter of last year FEA conducted ten, 1-1/2 day workshop sessions for school business officials, who manage the district's finances, and for plant engineers, who operate the facilities. The workshops provided an overview of the current energy situation, and presented information on how schools could undertake an effective energy management program.

Attendance averaged 100 at each workshop, and at each session approximately 85% of those attending said that as a result of the workshop they planned to either implement an energy management program or expand their present program. A similar workshop program was conducted for college administrators, business officers, and physical plant personnel. FEA is currently preparing the materials from both of these workshops for distribution to State Energy Offices for their use in continuing the program.

To realize the potential energy savings, FEA recommends that schools undertake a two-phased conservation program.

First, all schools should institute energy management programs concentrating on operations and maintenance improvements. By utilizing the Public Schools Energy Conservation Service and some form of on-site energy audits as part of this effort, the no-cost and low-cost energy conservation measures can be identified and implemented quickly at an average cost of no more than $1,000 per building.

By providing the necessary information and financial assistance to States under existing programs as well as the proposed National

Energy Act, FEA will enable schools to obtain the assistance required to undertake such conservation measures.

For those buildings where additional savings are justified through capital modifications, the President has proposed a 3-year, $900 million program to provide 40% Federal funding of the necessary improvements. This includes public and non-profit schools, colleges and universities, and hospitals. The President's program represents a substantial, and we believe sufficient, commitment of Federal funds to achieve the President's objective in this sector at this time.

The program outlined above stresses the dedication and commitment of local school districts to an initial energy management program involving minimal capital outlays followed by an extensive Federal cost-sharing grant program to be administered by the States to assist eligible schools to implement the necessary capital modifications. Working together, public and private schools, the States, and the Federal Government can take significant steps to alleviate the adverse impact of rising energy costs.

For the information of the subcommittee, I am submitting for the record a copy of Sec. 301 of the proposed National Energy Act which would fund energy conserving capital improvements to schools and hospitals.

I would now be pleased to answer any questions you may have.

Mr. BARDIN. We have an urgent national need to conserve energy, and it is in that context that I speak to a committee that looks at it in the context of the school, the school systems and the pupils in the school system.

President Carter's conservation program is directed to all sectors including the school sector. I think it is interesting that, according to Newsweek just a few days ago, President Carter talked to a group of visiting school students, and he urged them to take a leadership role in energy conservation by monitoring what goes on in your schools, in your public buildings, and in your own home. In many ways, as I listen to what my own children are bringing back from school, it seems to me that the school children of America and the teachers of America are somewhat ahead of us in grasping the seriousness of the energy problem and the conservation challenge that faces our country.

The previous panel has highlighted very dramatically and effectively the problem that is facing the school districts, the financial crunch that they are up against all over the country, and I think the committee has performed a significant public service in focusing on that aspect, that very real human, governmental and institutional aspect of our energy problem in this country.

Under the President's program, there are tax incentives for conservation investment in existing residential and commercial buildings, but those incentives won't work for the nonprofit sector, the nontax paying sector of our economy, including the schools, both the public schools and the other nonprofit schools, in our economy.

What is needed is a two-phase conservation program. Part of it is provided for under existing law. Part of it will require new legislation.

The first part is to identify and implement low cost changes in operations. In our judgment, these kinds of changes can save as much as 30 percent of the energy consumption in existing school systems.

If I may illustrate from my recent New Jersey experience, we had one community, West Milford, which looked into that very question. It was very fortunate that an engineer who happened to work for one of the energy companies in New Jersey ran for the school board. He ran on a platform of promising that if he was elected he would reduce energy consumption by 15 percent within 6 months. He got elected. He set out to do it and he achieved a 20 percent reduction within 6 months, saving $120,000 a year for that school board on eight school buldings at virtually no cost. It was the cost of analyzing the situation and changing the way in which they were operating. There is a lack of expertise in our school districts, which has to be met by going out there and giving them the know-how on how to run energy systems more efficiently.

Now that is a program that has been started under the leadership of Congress in its wisdom passing EPCA, the Energy Production and Conservation Act. That is a program that the FEA is managing in several different aspects. I will describe that to you very briefly.

The second part is more costly, and was also discussed earlier this morning. That requires capital improvements in the school build-

ings, and we estimate that that kind of program applied nationally could save another 15 percent in energy consumption. I have seen in New Jersey the problems in funding capital improvements to get that kind of job done in our public institutions.

Turning to the hospital sector, we analyzed the problem of our mental hospitals and others in New Jersey last year in connection with a bond issue that we proposed to the voters and successfully passed. We found, for example, 34 boilers were very ancient, out of date, inefficient. We found that for a cost of close to $8 million they could be replaced, and the savings in fuel would pay back that close to $8 million within 4 years.

I am glad to say the voters approved that bond issue and that will go ahead, but one of the things we need to do for our school districts, for our nonprofit school administrations and for similarly situated public bodies, the hospitals, is to give them a strong signal that the Federal Government wants them to achieve the economies, believes they can achieve the economies, and stands ready to help them achieve the economies and I think, Mr. Chairman, that is the signal that you are trying to send out, that this hearing is all about, and that President Carter, as an integral part of the national energy plan, is trying to send out to the administrators and school boards throughout the country.

Chairman PERKINS. You are telling us indirectly that President Carter is opposing this plan that we are presenting here.

Mr. BARDIN. The President has a specific plan which you mentioned, Mr. Chairman, in your question, and it appears in sections 301 through 309 of the National Energy Act proposal that was sent up to the Speaker last Friday. Perhaps for the sake of the record I could ask that it be included in the record at this point and give the reporter a copy.

Chairman PERKINS. Without objection, it is so ordered.

[The information referred to follows:]

********** Insert J **********

PART C - ENERGY CONSERVATION PROGRAM
FOR SCHOOLS AND HOSPITALS

Amendment to Energy Policy and Conservation Act

Sec. 301. Title III of the Energy Policy and Conservation Act is amended by adding at the end thereof the following new part:

"Part F - ENERGY CONSERVATION PROGRAM FOR SCHOOLS AND HOSPITALS

"Definitions

"Sec. 391. For purposes of this part:

"(1) The term 'building' means any structure that includes a heating or cooling system, or both, the construction of which structure was completed on or before April 20, 1977.

"(2) The term 'energy conservation measure' means --

"(A) insulation of walls, ceilings, attics, floors, ducts, and pipes;

"(B) double glazing of windows;

"(C) automatic energy control systems;

"(D) solar heating and/or cooling systems;

"(E) solar water heating systems;

"(F) furnace modifications limited to (i) replacement burners designed to reduce the firing rate or to achieve a reduction in the amount of fuel consumed as a result of increased combustion efficiency, and (ii) devices for modifying flue openings which will increase the efficiency of the heating system;

"(G) caulking and weatherstripping of exterior doors and windows;

"(H) reflective glass coatings;

"(I) lighting fixture retrofit, to the extent that such retrofit does not result in any foot candle per square foot increase in the general illumination level of the facility and conserves energy; and

"(J) electrical or mechanical furnace ignition systems which replace standing gas pilot lights, but only as part of a project which includes one or more of the energy conservation measures specified in paragraphs (A) through (I).

"(3) The term 'Governor' means the chief executive officer of a State.

"(4) The term 'hospital' means a public or nonprofit institution which is --

"(A) a general hospital, tuberculosis hospital, or any other type of hospital, other than a hospital furnishing primarily domiciliary care; and

"(B) duly authorized to provide hospital services under the laws of the State in which it is situated.

"(5) The term 'hospital facilities' means buildings housing a hospital and related facilities, including laboratories, outpatient departments, nurses' home and training facilities and central service facilities operated in connection with a hospital, and also includes buildings housing education or training facilities for health professions personnel operated as an integral part of a hospital.

"(6) The term 'public or nonprofit institution' means an institution owned and operated by --

"(A) a State, a political subdivision of a State or an agency or instrumentality of either; or

"(B) an organization exempt from income tax under section 501(c)(3) of the Internal Revenue Code of 1954.

"(7) The term 'project' means an undertaking to acquire and/or to install one or more energy conservation measures in school facilities or in hospital facilities.

"(8) The term 'project costs' shall be limited to costs incurred in the design, acquisition, construction, and installation of energy conservation measures.

"(9) The term 'school' means a public or nonprofit institution which --

"(A) provides, and is legally authorized to provide, elementary education or secondary education, or both, on a day or residential basis; or

"(B)(i) provides, and is legally authorized to provide, a program of education beyond secondary education, on a day or residential basis;

"(ii) admits as students only persons having a certificate of graduation from a school providing secondary education, or the recognized equivalent of such certificate;

"(iii) is accredited by a nationally recognized accrediting agency or association; and

"(iv) provides an educational program for which it awards a bachelor's degree or provides not less than a two-year program which is acceptable for full credit towards such a degree at any institution which meets the requirements of subparagraphs (i), (ii), and (iii) and which provides such a program. Such term also includes any public or non-profit institution which provides not less than a one-year program of training to prepare students for gainful employment in a recognized occupation and which meets the provisions of subparagraphs (i), (ii) and (iii) of paragraph (B).

"(10) The term 'school facilities' means buildings housing classrooms, laboratories, dormitories, athletic facilities, or related facilities operated in connection with a school, but does not include any facility used or to be used for sectarian instruction or as a place for religious worship, or any athletic facility used primarily for athletic exhibitions, contests, games, or other events for which admission is charged to the general public.

"(11) The term 'State' means a State, the District of Columbia, and at the discretion of the Administrator, Puerto Rico, or any territory or possession of the United States.

"Grant Authorization

"Sec. 303. (a) The Administrator is authorized to make grants to the States to assist schools and hospitals in the payment of project costs incurred in connection with projects undertaken pursuant to this part.

"(b) The Federal share of the project costs incurred in connection with any project shall not exceed 40 per centum thereof. The remainder of the project costs shall be provided from sources other than Federal funds.

"State Plans

"Sec. 304. (a) The Administrator shall, by rule, not later than 120 days after the date of enactment of this part, prescribe guidelines for the development of State plans for installation of energy conservation measures in school facilities and hospital facilities, including guidelines indicating the types of measures appropriate for each region of the nation. The Administrator shall invite the Governor of each State to submit, within 90 days after the effective date of such guidelines, or such longer period as the Administrator may, for a good cause, allow, a proposed State plan for such State. Such plan shall include --

"(1) A general description of the State's proposed program for installation of energy conservation measures in school and hospital facilities in

such State over the period for which funds are authorized to be appropriated pursuant to section 308, including --

"(A) the types of energy conservation measures considered for installation in school and hospital facilities under projects undertaken pursuant to this part;

"(B) categories of school and hospital facilities for which installation of energy conservation measures are proposed (as may be required by the guidelines); and

"(C) an estimate of the energy savings anticipated for each type of proposed project.

"(2) The policies and procedures by which the State proposes to allocate funds among eligible projects within the State, including a description of how priorities will be established among competing proposals, based on relative financial needs and capabilities.

"(b) Each State plan shall be reviewed and approved or disapproved by the Administrator not later than 90 days after submission. A Governor may submit a new or amended plan at any time after submission of the original plan if the State obtains the consent of the Administrator.

"(c) Governors submitting plans pursuant to this section shall take reasonable steps to assure that such plans are appropriately coordinated with State health plans required pursuant to section 1523 of the Public Health Service Act.

"Financial Assistance

"Sec. 305. (a) The Administrator shall provide financial assistance from sums appropriated for any fiscal year under this part only upon annual application. The Administrator shall allocate the sums appropriated for that fiscal year among the several States in the following manner:

"(1) Ninety per centum among all States in accordance with a formula to be determined by the Administrator, by rule, taking into account population, climate, and such other factors as the Administrator may deem appropriate.

"(2) Ten per centum among all States as the Administrator shall determine, after taking into account the availability and cost of fuel or any other energy used in schools and hospitals in the several States and such other factors as he deems relevant.

"(b) Any amount allocated to a State for a fiscal year under subsection (a) but not requested by a State or not disbursed pursuant to an approved State plan shall be available for reallocation to the States as the Administrator shall determine in accordance with subsection (a)(2).

"(c) The Administrator shall prescribe rules limiting the amount of funds allocated to a State which may be expended for administrative expenses by such State.

"Applications

"Sec. 306. (a) Applications of States for financial assistance under this part shall be made annually to the Administrator, shall be consistent with State plans approved pursuant to section 304, and shall contain or be accompanied by such information as the Administrator may reasonably require. Such information shall include the number of projects and categories of facilities proposed to be funded within such State, and such information concerning expected expenditures as may be required by rule.

"(b) The Administrator shall not provide financial assistance under this part unless the applicant has provided reasonable assurances that it has -

"(1) established procedures to assure that funds made available under this part will be expended for project costs in compliance with the requirements of this part and rules promulgated under this part;

"(2) established procedures for allocating funds among eligible projects on the basis of relative need, taking into account appropriate financial, climatic and energy conservation factors;

"(3) established procedures for implementation of energy conserving operational and maintenance procedures in those facilities for which projects are proposed;

"(4) established policies and procedures designed to assure that financial assistance provided under this part will be used to supplement, and not to supplant, State, local or other funds, and, to the extent practicable, to increase the amounts of such funds that would be made available in the absence of Federal funds for carrying out this part;

"(5) established procedures to provide reports to the Administrator in such form and containing such information (including information for evaluation purposes) as the Administrator may reasonably require and to keep such records and furnish access thereto as the Administrator may find necessary to assure the correctness and verification of such reports; and

"(6) established procedures to ensure that equitable consideration is given to all eligible public or nonprofit institutions regardless of type of ownership.

"Administration

"Sec. 307. The Administrator is authorized to prescribe such rules as may be necessary in order to carry out the provisions of this part.

"Authorization of Appropriations

"Sec. 308. (a) For purposes of making grants pursuant to this part, there is authorized to be appropriated not to exceed $300,000,000 for each fiscal year in the three consecutive fiscal year period ending September 30, 1980.

"(b) For expenses of the Administrator in administering the provisions of this part, there are authorized to be appropriated such sums as may be necessary to carry out the provisions of this part for each fiscal year in the three consecutive fiscal year period ending September 30, 1980.

"Nondiscrimination

"Sec. 309. No person in the United States shall on the grounds of race, color, religion, national origin, or sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this part."

Mr. BARDIN. The President's proposal on that second stage which requires capital funding is to authorize $300 million a year for 3 years, as your initial authorization, to provide grants covering 40 percent of the cost of certain capital improvements, improvements for insulation, for example, or improvements to add solar heating facilities, for achieving distinct fuel economies in the public school systems and the nonprofit sector, the nonpublic school systems, and in hospitals.

The school systems of this country spent $1.5 billion in fuel in 1975. That was an increase of more than $500 million from 1972, and that is not even taking account of the kind of conditions we had in the extreme weather situation of last year.

They need help. They need first analytic help. They need somebody to come in and tell them. Not every school district has the good fortune of having a top-notch engineer on the school board, and we think they need the kind of assistance that we are trying to reach out to them, to identify their problems.

We do it through four programs, a computerized analysis of their energy use, to identify extraordinary high energy uses, a mini-audit which we developed in connection with the State of Minnesota Energy Agency, which includes a quick onsite inspection, a maxi-audit, which we developed in connection with the American Association of School Administrators, and that includes a thorough energy audit of the given building, plus a workshop program to get the message across to a large number of managers at one time.

In my judgment, it would be wise to integrate all of these programs in one.

You asked before about the advantages of direct grants through the Federal Government to the school district as contrasted to going through the governors, which I take to mean the governors using their State energy offices. One advantage that I think you ought to consider in using the governor and the State energy officers is the chance to integrate the grant for this kind of public works program with the ongoing program that has been started by FEA and is being worked on by ERDA, to identify the facts, give the school districts the benefit of the know-how that we can supply to them.

In my experience, it takes time to make a public works program work, and many of our local governmental bodies are not ready for it. They have to hear that there is a grant, a very substantial grant program available. They have to have it explained. They have to review through their own processes whether it makes sense to put up the local match.

I don't have to tell you the difficulties that you encounter on the local level, if it is done purely locally, or even on the State level, if the State assists with some funding, to raise the non-Federal share of these programs. We have got to get a very strong message across to thousands and thousands of school districts in America.

The fact was put out dramatically in the statement by the school administrators before, about how we have been building school buildings in the days when energy was cheap and abundant, and we assumed there would be no problem. That has certainly been true in New Jersey too. For at least 10 years, really most of the last quarter century, we have been building buildings with a minimum

of insulation and a maximum of spread, when it has been a question of how do you cut down the capital budget for school construction? Things like insulation are always easy to trim if you assume a low energy cost.

Now we are trying to reverse that cycle. We are trying to retrofit. It is going to be a tough problem, a difficult one, which will take a very strong message from Washington, D.C., the Congress the executive branch, to thousands and thousands of school districts who have to get the job done. I think it is important that you see to it that they have the kind of technical assistance that I think can best be done by taking advantage of the programs we have already started, through previous congressional enactment under the Energy Production and Conservation Act.

Thank you very much, Mr. Chairman. I would be happy to answer questions.

Chairman PERKINS. Mr. Schmidt, do you have anything additional to add?

STATEMENT OF THOMAS C. SCHMIDT

Mr. SCHMIDT. Mr. Chairman, my name is Thomas Schmidt. I am Commissioner of Education in the State of Rhode Island. I am here representing the State of Rhode Island, and also speaking for the Chief State School Officers of which I am a member, and also vice chairman of the Legislative Committee.

With me is Mr. John Adams, who is the representative from the Chiefs who could answer any questions you might have that cover more details.

Chairman PERKINS. Without objection, your prepared statement will be inserted in the record.

I would just like to ask one thing of the State superintendent of Rhode Island—and this is Senator Pell's State.

Do you favor the approach that we are taking here or do you favor the approach recommended by the Administration?

Mr. SCHMIDT. Mr. Chairman, I had the great pleasure to testify before Senator Pell on S. 701 about 3 weeks ago, the companion bill to yours. It is a pleasure to be here today. I am strongly in support of the kind of approach taken by these two bills. I would like to get into kind of a middle-of-the-road, coordinative approach to some of the issues with especially the grants, where it has to do with coordination of school districts and working with school districts in clusters rather than on a one-by-one basis.

Chairman PERKINS. Do you have any further comments on that yourself?

Mr. Cross.

Mr. CROSS. Thank you, Mr. Chairman.

One thing that has puzzled several of us in President Carter's proposal on energy in section 301, it includes provision for assistance to church-related and secondary schools. That would seem to fly in the face of Supreme Court decisions and constituted Federal policy and everything else, and I would wonder what your comments on that are, whether the constitutional issue was examined when the bill was drafted, and what your views are, and whether there is Justice Department memoranda supporting this assistance.

Mr. BARDIN. I believe that the general question has been examined, and the conclusion reached by the Administration in drafting the bill was it would be incorrect to pay for insulating say the chapel in a parochial school, but that there is already precedent for limited aspects of assistance in the case of nonpublic parochial schools.

I think you ought to remember that the context of the Administration bill is to reduce fuel consumption and help those nonprofit sectors of the economy to reduce their consumption, both for national interest, patriotic reasons, and to help save funds for their own budgets. This is not a bill that aims at establishment of religion or assisting any religious group as such. As to the Justice Department, I am not in a position to advise you one way or the other.

Mr. CROSS. I think you will find the established precedent you speak of is in relation to colleges and universities in which there has been aid for construction and loans for construction. I think you will find it has not been true in elementary and secondary, and this is really a departure. I would like to ask that one of you go back and ask if there is any legal basis and if there is something that we could have for our hearing record.

Mr. BARDIN. I will be happy, sir, to check into that and supply you with further information on the subject.

Chairman PERKINS. I have a question for the gentleman from the Commerce Department.

Could you provide us some information about the participation of schools in the public works program, because that includes a priority for energy conservation?

Mr. STEPHAN. May I proceed with my statement and answer the counsel's statement?

Chairman PERKINS. Without objection, your statement may be inserted in the record.

[Statement of Edward Stephan follows:]

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STATEMENT
OF

EDWARD STEPHAN, DEPUTY DIRECTOR, INDUSTRY/ASSOCIATION
PROGRAMS DIVISION, OFFICE OF ENERGY PROGRAMS,
U. S. DEPARTMENT OF COMMERCE

CONCERNING H.R. 5996

TO AMEND THE ELEMENTARY AND SECONDARY EDUCATION ACT OF 1965 TO PROVIDE FEDERAL FINANCIAL ASSISTANCE TO LOCAL EDUCATIONAL AGENCIES IN ORDER TO ASSIST THEM IN MEETING THE EMERGENCY CAUSED BY THE HIGH COST OF FUEL SHORTAGES AND ADVERSE WHEATHER CONDITIONS, AND FOR OTHER PURPOSES.

BEFORE THE

COMMITTEE ON EDUCATION AND LABOR
SUBCOMMITTEE ON ELEMENTARY, SECONDARY
AND VOCATIONAL EDUCATION

MAY 3, 1977

Mr. Chairman and members of the committee, I am Edward Stephan. I appreciate the opportunity to appear before you today to offer testimony on the Amendment to the Elementary and Secondary Assistance Act of 1965. The information provided is taken from my experience as a school administrator. As such, my responsibilities were primarily for the Planning, Construction, and Operation of Education Facilities. My undergraduate studies were in Engineering and Management and my graduate studies were in Educational Administration, with a concentration in Business and Finance.

Prior to joining the Federal Government, my experience included being an Assistant Superintendent for Educational Facilities Planning and Construction, Coordinator for Educational Facilities, and School Plant Manager, in large urban and suburban school systems. I went to the Federal Energy Administration from a construction consulting and engineering firm which was retained by the Chicago Board of Education to manage the rehabilitation of 365 Schools with a projected budget of $320,000,000. I was the program manager of this project.

As Director of the Office of Institutional Buildings Programs for FEA I initiated a number of projects designed to assist schools colleges and universitites, and influenced development and implementation of others. Some of these

projects are: the "Survey Of Local School Districts' Energy Use," which was implemented in-house; the study of ten elementary schools, in widely varying climalatalogical regions which was done under contract with the American Association of School Administrators and the conduct of ten, intensive workshops for school plant administrators and business officials, done under contract with the Council of Educational Facility Planners. This contract required development of materials to guide local educational agencies in undertaking measures to improve the energy efficiency of their buildings.

During my tenure as a school administrator I was particularly interested in conservation and my work in this area drew the attention of the Educational Facilities Laboratories, (EFL) which was at the time an affiliate of the Ford Foundation and fully funded by them. I was asked to serve on a panel of five specialists to advise EFL on the development and research of a book entitled "The Economy of Energy Conservation in Educational Facilities." First printing was July 1973 (before the Arab Oil Embargo) and has been so successful that it is now in its fourth printing. Subsequent to this, EFL invited me to submit a proposal, on behalf of the Fairfax County School Board, for financial assistance, to conduct a study to determine "The Potential for Energy Conservation in the Public Schools." The results of this in-depth study showed conclusively that opportunities to improve the energy efficiency of schools abound. This

study also served as the basic research for development of the Public Schools Energy Conservation Service (PSECS) produced by the Educational Facilities Laboratories Inc., under contract with the Federal Energy Administration. This program enables local educational agencies to submit limited information about their buildings to EFL so that its energy performance can be compared against a model energy efficient building. And to determine, by providing some additional information, which areas of the building is contributing most to its energy inefficiency and which should be investigated for possible alteration and/or modification. This service, tested on more than 2,000 elementary schools and, coupled with the American Association of School Administrators study of ten elementary schools validates the potentials and identified those measures which will significantly improve the energy efficiency of the Nation's schools.

The studies and investigations alluded to above provide conclusive evidence of the energy conservation opportunities that exist. The 1975 Federal Energy Administration "Survey of Local School Districts Energy Use" documents the negative impact higher energy costs is having on local educational agencies.

I understand that copies of the Report have been supplied the committee. However, another part of this study provides more insight as to the pressure higher energy costs has placed on local educational agencies to compromise educational programs. A copy of excerpts from this study which represent several, at random, face-to-face interviews with school administrators, is attached.

Much has been done by the Nation's schools to conserve energy as the "Report to Survey Participants" clearly shows. Much is still being done. Most of what is being done is in the form of upgrading operations and maintenance practices and in the more prudent scheduling of building use. There have been some low and so called no cost modifications which have brought good results. However, the sizeable and sustaining energy conservation advances that are achieveable require some capital expenditures. There is no longer any question about the energy conservation opportunities attainable through capital investments, it remains only to select and implement those known alterations and modifications that will maximize the investment.

Before discussing any of the specific provisions of H.R. 5996 I note for the record that the President proposed National Energy Act contains a section that would establish a program of energy conservation for both schools and hospitals. I

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understand that the FEA witness will address the President's proposal in some detail for the subcommittee, and accordingly, I will simply urge favorable consideration of the President's proposal in lieu of H.R. 5996. However, with respect to H.R. 5996 the following comments may be helpful to the subcommittee.

Section 1006(a) of the Bill authorizes $30,000,000 in grants for demonstration projects which involve the development and use of energy conservation measures which show unusual promise. I appreciate, and I am completely sympathetic with the objective of this title, but believe that with the abundance of available knowledge about what can be done, it is unnecessary. Other agencies such as the Division of Solar Energy of the Energy Research and Development Administration have been working in this area and awarded a number of grants to local educational agencies to support demonstration projects.

Section 1007(a) authorixes $120,000,000 in grants to pay the federal share of providing technical assistance for energy conservation measures. I do understand the intent of this section. However, I am of the opinion that there is sufficient know how and that the experience and expertise exists in the engineering profession and construction industry to provide the required technical services to identify the cost effective

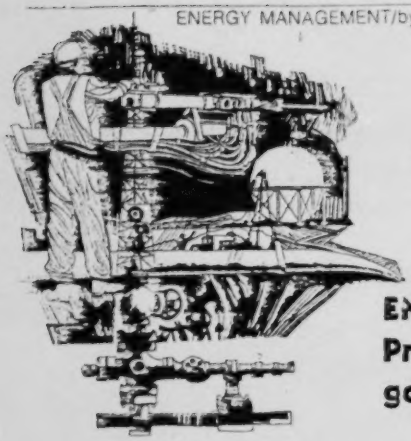
energy investments, and in rank order. The information is readily available through professional and trade journals and published books. Further detailed information is available by attendance at conferences, seminars, and workshops, usually sponsored by professional associations, trade associations, State Department's of Education, colleges and universities, and oft times industries who manufacture building equipment and materials.

It is my considered judgement that the need to invest the money in energy efficient capital improvements, utilizing known technology and on the shelf hardware, to produce the most significant energy reductions and in the shortest possible time, should receive the highest priority. This is the basic thrust of the President's proposal.

In closing may I say that I appreciate the opportunity to appear before this committee to comment on this important issue.

I would be pleased to respond to any questions members of the committee may have.

ENERGY MANAGEMENT/by Edward Stephan



ENERGY COSTS: Programs are going up the chimney.

According to the Maintenance and Operations Cost Study published by *American School and University* magazine last month, the average school district in the United States is spending $12.12 more per pupil for fuel and other utilities this year, as compared to just one year ago.

Multiply that figure by a conservative estimate of 44 million students in the nation's public schools, and one sees that $533 million NEW dollars are being spent on fuel and other utilities this year. Add to that the spending of private schools and colleges and one can easily see that increases in fuel and utility prices have cost all education more than one billion dollars this year alone.

Now those are pretty startling figures, pretty big figures, but what really counts is what that means on the local level. To underscore the effect of increased fuel prices on educational programs, the Federal Energy Administration has assigned a consultant to carry out a series of interviews around the nation. That program is just getting underway, but the first few reports are in and I'd like to share some of the information with you.

Glen Rock, N.J.

Glen Rock is a suburban community in northern New Jersey with about 2,500 students. It has been beset over the last year with all of the fiscal problems that school districts in that state have had to contend with. Beyond that, it has had its school budget defeated four years in a row.

In 1969-70, before fuel and utility costs began to rise, the district spent just under $57,000 on oil, gas and electricity. In 1974-75, the cost for these same services—for the same buildings and for approximately the same number of students—was almost $181,000, an increase of $114,000. In 1969-70, fuel and utilities accounted for 1.47% of the district's budget. In 1974-75 these items accounted for 3.13% of the budget. Had the cost of fuel and utilities risen at the same rate as the school budget, the district's expenditures last year would have been less than $85,000. In other words, this small district put $96,000 NEW dollars into fuel and utilities last year as a result of the extraordinary rise in prices, approximately $38 for every child in the district's schools.

What does $96,000 a year represent to Glen Rock? According to Superintendent Betty Ostroff, the district has been in an enforced budget cutting program over the past several years. To be specific, over the period of greatest fuel cost increases, the district has eliminated two assistant superintendents, one for curriculum, one for personnel, and now has none; it has cut its physical education, nursing, speech, music and art staffs in half; it has eliminated districtwide reading and library specialitsts at the elementary level; and has cut back by eight teachers last year, 10 to 12 are to be eliminated next year.

"Part of the teacher cutback is for student enrollment decline," Dr. Ostroff admits, "but a large chunk of that cutback is for dollar savings alone. And all of the other

cuts I've described were for reasons of economy. It would take about $150,000 to restore them. Of that amount, almost two-thirds is eaten up by increased fuel and utility costs.

"Not only does fuel cost us more, we're using more than we should be—we're wasting the resources of the future—because we don't have the dollars needed to go in and improve our buildings and our heating systems and controls. It's a vicious circle. Until we get money from outside to improve our physical plant and cut down on the waste of fuel, we're going to have to struggle, while the money we need for education literally goes up the chimney."

Mamaroneck, N.Y.

Mamaroneck, located in Westchester County, N.Y., is a somewhat larger district than Glen Rock (6,200 students) but the problems are basically the same.

According to Paul McDevitt, the district's business manager, in 1972-73, when fuel costs were already beginning to climb, the district spent $286,000 on fuel and utilities. This amounted to 2.35% of the district's $12,144,000 budget.

Because it was obvious that costs were rising, the district embarked on a program to cut fuel use. Thermostats were set down to 68 degrees during the day, 64 at night. A program of heating control replacement was started. Training programs were instituted for custodians. Cleaning of boilers and tuning of burners was put on a regular schedule. Some lights were eliminated in corridors and a campaign started in every room to turn out lights when leaving. Window replacement was undertaken on a programmed basis to cut down on heat loss. Finally an oil inventory control program was instituted so that the district could keep better records on what it was using, where and why. Altogether the district invested about $40,000 in upgrading.

The winter of 1974-75 was far milder than ordinary. And all of the changes cited above had taken place. Nevertheless, the cost of fuel and utilities for the district rose 95% over the two-year period to $558,000. Fuel and utilities now accounted for 3.86% of a $14.4 million budget. Had the cost of fuel and utilities increased only at the same rate as other items in the budget, the district would have had an extra $218,000 to use for educational purposes in 1974-75.

What has the loss of $218,000 in annual available funds meant to the district? "In the first place, that's close to $1.50 on our tax rate," Superintendent Otty Norwood points out. "It can be the difference between winning and losing a budget vote."

What has Mamaroneck dropped to pay for its fuel and utilities? "Last year we cut 13 teaching positions, most as economy measures," says Norwood. "Class size went up as a result and it means we cannot give the kind of attention to individual children that our parents demand, our school board and administration and teachers want, and our students need.

"In addition we've cut administrative positions. We've also cut back on our nurse services and our library services in an effort to save dollars.

"Two other places where we've cut back perhaps hurt more than any others: Our budget for supplies and equipment and our program for teaching disabled children, which had just begun to make inroads into this serious problem."

Newton, Mass.

Newton is a western suburb of Boston, a city in its own right, with a mixed population and a national reputation for outstanding education. It is also a school district that is strapped for money.

Newton is a large school district—16,000 students. Its budget in 1971-72 was over $24 million. In 1974-75 it was more than $29 million. In 1971-72, fuel ($299,000) and utilities ($341,000) accounted for 2.6% of the district's budget.

It's a vicious circle. Until we get money from outside to improve our physical plant and cut down on the waste of fuel, we're going to have to struggle . . . .

Betty Ostroff

Three years later, fuel costs had risen by 117.5% to $650,000. Utility costs had gone up 112.5% to $724,000. Together, fuel and utilities amounted to 4.7% of the district's budget. Had these costs *only* risen as quickly as the budget itself, the district would have had $600,000 more for educational purposes in 1974-75 (and each subsequent year) than it did, almost $38 per student.

"The concept of having an extra $600,000 for educational purposes is overwhelming," says Superintendent Aaron Fink, "particularly right now when the School Committee has told me to bring in, for next year, a budget exactly equal to what we are spending this year.

"To go back a year, for 1975-76, we were faced with new budget mandates that we could not control that added more than $1.5 million to our budget. This included negotiated salary increases, new programs mandated by the state, health insurance increases and fuel and utility cost increases. Fuel and utility was the largest single bite—more than half a million dollars. If we had not had to carry that increase, and could have, in addition, added $600,000 saved from previous increases to the school budget, it would have changed the whole tenor of our school system. For one thing, instead of asking for 1.5 million *new* dollars, we would have needed just $400,000, quite a difference. We could even have thought about improving education in Newton, instead of constantly cutting back.

"For 1976-77, I have a mandate from my Board—'come in with a no-increase budget, spend only what

was spent a year ago and don't allow for any inflation, salary increases, benefit increases or fuel and utility increases." Given that set of circumstances, $600,000 in found money—money not spent on fuel and utilities—would solve a lot of problems.

"It would certainly mean that we would not have had to cut our staff and therefore program. We could provide more materials in the classrooms, books in the library, the tools that make education happen. We could institute new programs that are badly needed and retain some that had to be cut even though they were serving the needs of the children.

But for many of us, that period of weeding out the questionable areas, of eliminating marginal programs has long since passed. We're now well into the flesh and blood of education.

Aaron Fink

"Every district in the nation is currently faced with cutting program, cutting services, cutting tools of education. Some of this is good. We're being forced to take a hard look at what we're doing and justify it. We're being forced to eliminate that which isn't really effective. Education is no different from private industry or the federal government in that some things we do become regular parts of the program without ever truly being evaluated. Now we must evaluate, and that's fine.

"But for many of us, that period of weeding out the questionable areas, of eliminating marginal programs has long since passed. We're now well into the flesh and blood of education. And it hurts—really hurts—when you see a non-educational account taking an extra $600,000 out of your budget and then you sit around and eliminate a key teacher or administrator to save $15,000 or $20,000 in order to pay your fuel and utility bills."

Tufts University

Tufts University, located in the industrial suburb of Medford, Mass. just north of Boston, has 240 buildings containing almost 1.5 million sq. ft. The cost of fuel is a major concern.

The rising cost of fuel has added more than $400,000 to the Tufts budget during the last three years, despite major efforts by the grounds and buildings department to make savings. These efforts have ranged from adding insulation in a number of buildings to cutting off exhaust fans at night (particularly in dormitory bathrooms), to setting thermostats lower, to cutting down on lighting (38 watt fluroescent tubes are replacing 40 watt; fluorescents are replacing incandescent fixtures), to having thermographic photographs taken of the campus in order to pinpoint areas of greatest heat loss.

The increased cost of fuel has not been felt directly in the academic program. Instead it has cost 16 jobs in the grounds and building department, plus a lot of tightening up here and there. But according to Dr. McCarthy, the loss of that $400,000 has had a serious depressing effect on academic planning and on the ability to move ahead.

"It's cost us a lot of little things," she says. "We've lost planning staff and that can have serious consequences. We've been moving towards a better physical education program for women but we lack facilities. We don't have the money to put them in—that's part of the $400,000 right there.

"That kind of money each year would make it possible for us to institute new programs or keep old ones. A department could run on $400,000 a year successfully. We could widen our ability to serve students.

"When you come down to it, we're talking about a small percentage of a college's budget—not really a great deal of money by itself. But every college administration knows that the little margin is what makes you a good college or a less good one. For us, $400,000 could be the margin between being just an ordinary institution and being an interesting one. We want to be one of the interesting ones, but rising fuel costs make it increasingly difficult."

The real effect

For me, that last statement sums up the whole problem. Conserving energy is an important national concern, and for its own sake we should be doing it, but looking specifically at eductional institutions, the effect of rising fuel and utility costs is measured in much more than dollars and cents or even ecological sense. It can be measured in program—in what these added costs are doing to our nation's children. It's not a happy picture. Certainly, any district that can, ought to take a long look at its present fuel usage program and take every step possible to insure that the money it has is being used for education and not just going up the chimney.

If your district's programs have had to be curtailed to pay increased fuel bills. I'd like to learn about it. Please drop me a line at the Federal Energy Administration, Washington D.C. 20461.

Mr. Stephan is Director of Institutional Buildings Programs for Energy Conservation, Federal Energy Administration, Washington, D.C. His articles about "Energy Management" appear regularly in AS&U.

STATEMENT OF EDWARD STEPHAN

Mr. STEPHAN. Mr. Chairman and members of the committee:

I am Edward Stephan. I appreciate the opportunity to appear before you today to offer testimony on the amendment to the Elementary and Secondary Assistance Act of 1965. The information provided is taken from my experience as a school administrator. As such, my responsibilities were primarily for the planning, construction, and operation of education facilities. My undergraduate studies were in engineering and management and my graduate studies were in educational administration, with a concentration in business and finance.

Prior to joining the Federal Government, my experience included being an assistant superintendent for educational facilities planning and construction, coordinator for educational facilities, and school plant manager, in large urban and suburban school systems. I went to the Federal Energy Administration from a construction consulting and engineering firm which was retained by the Chicago board of education to manage the rehabilitation of 365 schools with a projected budget of $320 million. I was the program manager of this project.

Chairman PERKINS. Let me interrupt you a minute. I am going to ask this lady a question.

Dr. Savitz, you stated that the energy costs of elementary schools has doubled from 1972-1973 to 1975-1976. Do you have any estimates for increases for the school year just ending?

Dr. SAVITZ. We have some estimates that instead of the roughly $38 per pupil it would be about $42 a pupil in the 1976-77 year, so they have gone up another 10 percent.

Chairman PERKINS. I want to say that two other subcommittees are marking up, and I would like to have any comments that you would care to make be inserted in the record.

Without objection, that will be in order.

Go ahead, Mr. Chris Cross.

The gentleman wants to make a statement.

Mr. CROSS. Mr. Stephan, would you like to conclude your statement?

Mr. STEPHAN. Yes, sir, as I indicated, I went to the Federal Energy Administration from a construction consulting and engineering firm which was retained by the Chicago board of education to rehabilitate 365 of the Chicago schools and a budget of some $320 million which involved at that time in 1972-73 investigations as to the opportunities for energy efficiency in the rehabilitation.

As a former Director of the Office of Institutional Buildings Programs for FEA I initiated a number of projects designed to assist schools, colleges, and universities, and influenced development and implementation of others. Some of these projects are: the "Survey of Local School Districts' Energy Use," which was implemented in-house; the study of 10 elementary schools, in widely varying climatological regions which was done under contract with the American Association of School Administrators and the conduct of 10 intensive workshops for school plant administrators and business officials, done under contract with the Council of Educational Facility

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The studies and investigations alluded to above provide conclusive evidence of the energy conservation opportunities that exist. The 1975 Federal Energy Administration "Survey of Local School Districts Energy Use" documents the negative impact higher energy costs is having on local educational agencies.

I understand that copies of the report have been supplied the committee. However, another part of this study provides more insight as to the pressure higher energy costs have placed on local educational agencies to compromise educational programs. A copy of excerpts from this study which represent several, at random, face-to-face interviews with school administrators, is attached.

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implement those known alterations and modifications that will maximize the investment.

Before discussing any of the specific provisions of H.R. 5996 I note for the record that the President's proposed National Energy Act contains a section that would establish a program of energy conservation for both schools and hospitals. I understand that the FEA witness will address the President's proposal in some detail for the subcommittee, and accordingly, I will simply urge favorable consideration of the President's proposal in lieu of H.R. 5996. However, with respect to H.R. 5996 the following comments may be helpful to the subcommittee.

Section 1006(a) of the bill authorizes $30 million in grants for demonstration projects which involve the development and use of energy conservation measures which show unusual promise. I appreciate, and I am completely sympathetic with the objective of this title, but believe that with the abundance of available knowledge about what can be done, it is unnecessary. Other agencies such as the Division of Solar Energy of the Energy Research and Development Administration have been working in this area and awarded a number of grants to local educational agencies to support demonstration projects.

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It is my considered judgment that the need to invest the money in energy efficient capital improvements, utilizing known technology and on-the-shelf hardware, to produce the most significant energy reductions and in the shortest possible time, should receive the highest priority. This is the basic thrust of the President's proposal.

In closing may I say that I appreciate the opportunity to appear before this committee to comment on this important issue.

I would be pleased to respond to any questions members of the committee may have.

Mr. LE FANTE. Thank you, Mr. Stephan. I am sorry I was delayed, but I can assure you every Member of this committee will review your testimony and all testimony presented here this morning with great interest.

We do have our problems, don't we?

Mr. STEPHAN. Yes, we do, sir.

Mr. LE FANTE. Mr. Schmidt, did you have further comments, sir?

Mr. SCHMIDT. Mr. Chairman, I would like to have a few moments just to speak in support of the bill.

Mr. LE FANTE. It's my understanding that you have not completed your testimony.

Mr. SCHMIDT. That is correct.

Mr. LE FANTE. We would like to afford you the opportunity to present it now.

Mr. SCHMIDT. Thank you very much.

I would like to submit my written comments for the record, and just speak informally if I may.

Mr. LE FANTE. No objection.

STATEMENT OF THOMAS C. SCHMIDT, COMMISSIONER OF EDUCATION, STATE OF RHODE ISLAND, VICE CHAIRPERSON, COMMITTEE ON LEGISLATION COUNCIL OF CHIEF STATE SCHOOL OFFICERS, ACCOMPANIED BY JOHN ADAMS, DIRECTOR, FEDERAL-STATE RELATIONS COUNCIL OF CHIEF STATE SCHOOL OFFICERS.

Mr. SCHMIDT. Thank you.

There are three points about the bill that I would like to speak to. Beyond the necessity of this bill, I think it's tremendously important, and other speakers have indicated the importance of this kind of bill.

Our school districts need this kind of front end money to be able to get along with the business of creating better energy efficiency in the schools.

The three points and modifications I would like to suggest have to do with the basic grant concept within the bill. As it is now set up, the money would flow directly to the local school district with the State and Administration in kind of sign-off position, and I know it's difficult for State school officers to say that is not quite the right way to do it; it ought to flow through the State, and then the local schools.

I would like to support that contention with the idea it is very helpful to have a coordinative response within a State. We, for example, have been working for over two and a half years with a task force representing higher education, as well as elementary and secondary, trying to bring together the many different approaches to energy conservation, retrofitting, trading, all of the rest that goes with it, and that type of task force and coordination has proved very beneficial.

Even this last winter when the conditions were so extreme, there were many mayors of local cities and towns that wanted to close the schools immediately and capture great savings, and we were able to demonstrate by doing it on a coordinated basis rather than on an individual school district basis there was more utilization and better efficiency. We have, for example, logged and are continuing to log monthly consumption of each of the schools.

We have brought university specialists into the schools to work on the heating mechanism problems. This summer we are going to employ CETA employees throughout the schools, helping with instrumentation and calculating and fairly simple activities that can be done in this kind of a program.

We have moved to work with the health department to change some of our health regulations.

This, and the fact that in my State and in many States around the country, in fact most of the States around the country, the capital programs within the schools are increasingly becoming a concern, if not a responsibility, of State government itself. This is because with the declining enrollment, State governments have found it useful to monitor either through planning or to actually fund entirely the capital improvements and developments in the local school districts.

These programs that you are suggesting in the bill, any of them will fall into the capital improvements, and, therefore, it seems very, very useful to have some of that flow through the States, so that coordinative aspect of it can be brought to bear on the capital improvements.

One other point in the bill speaks to allocation. It says 50 percent of the basic grants money would be allocated in an equitable fashion among the various States.

I think we would like to see a further definition of equitable, before that is given over to the administrative offices to set up their guidelines for that.

The equity I would be looking for would be an equity based upon energy need. There are certainly certain types of schools and certain sections of the country that have extraordinary impact, and I believe that their needs should be met first in order to care for the very serious dollar problems that they have.

Finally, I would hope that it might be possible to add within the act some type of emphasis upon energy education. I sit here before you as a non-smoker, not because I wanted to stop but because my kids made it so difficult for me there wasn't much I could do about it. Children, when educated, have a tremendous power, and I think in the energy process that a very strong education program among the children in our schools would have enormous long term payoff among the adult population as well as among themselves as they grow to assume more responsibility.

So these three aspects of it, Mr. Chairman, I would suggest, might be considerations that you and other members of the committee might wish to look at.

I thank you for the opportuity of appearing before you, and I am very enthusiastic in my support of H.R. 5996.

Mr. LE FANTE. Thank you, Mr. Schmidt.

Does anyone have any questions of Mr. Schmidt?

Mr. CROSS. I did have a question of Mr. Stephan which we never got to, and that was the question of how the participation of schools has been in the public works program, and I wondered if you could address that.

Mr. STEPHAN. In the program just being concluded, the schools were eligible, even though there was a slight and modest penalty for being a public school, but they did participate and surprisingly well. I don't have the exact figures here, but I think it was somewhere in the vicinity of from 15 to 25 percent of the funds.

Mr. CROSS. Would you supply those for the record, the exact figures?

Mr. STEPHAN. Yes, I can.

Mr. CROSS. Also supply how much that might have been in energy related areas.

Mr. STEPHAN. That would be difficult to determine because as I was receiving calls and some 500 also from around the country from school superintendents, I was advising them to make application and emphasize the problems they were having with their higher energy costs, and also emphasize their desire to modify their buildings in order to comply with the handicapped access. But, generally, it was my judgment that most did emphasize the need to modify and alter their buildings in order to improve the energy efficiency of the building, and I am sure that contributed substantially.

I shall endeavor to get as accurate figures as possible for the committee.

[Information has not been received by the subcommittee.]

Mr. CROSS. The new Public Works Program actually has a priority for energy efficiency, does it not?

Mr. STEPHAN. I understand there have been some rapid changes. I couldn't tell you what it was as of this morning, or since the Joint Committee.

Mr. CROSS. Anything you can supply us along those lines will be helpful too.

Mr. STEPHAN. I shall look into that.

Mr. CROSS. Mr. Bardin, I wonder if you might comment upon the participation of schools that is likely to be in the new Loan Guarantee Program which I think was authorized in Public Law 93-485?

Mr. BARDIN. Perhaps Dr. Savitz could comment.

Dr. SAVITZ. What has been shown is many schools are not able to participate in loan guarantee programs. This was part of the reason the Administration chose to select this proposed legislation that it has for the matching grant program. They just aren't in the financial position to take part in them as opposed to private industry.

Mr. CROSS. But there will be school participation?

Dr. SAVITZ. The school participation is not precluded from the guidelines. It's just felt that is not a financial mechanism they prefer to use, or because of the security you have to have behind it and just the ability to go borrow money is difficult for a public sector institution to do.

Mr. BARDIN. My experience in running analysis programs, and Congressman Le Fante is familiar with some of the key programs we run successfully in New Jersey you really need to work on two ends of the candle. On the one end you have to demonstrate to the local government body whether it's a school district or sewer agency that there is a job that needs to be done, and has to be done, and the world would be better off if you do it, and in this case that there are moneys to be saved in the long run in fuel costs by doing it.

On the other hand, there is tremendous inertia to overcome. Some is the human side and some of the inertia is the very real and practical problems of growth and local bond issue, of getting a budget decision made at a local level. In New Jersey we have additional State restrictions we just adopted last year on the right of local government to increase, the tax increases of a local govern-

ment, which is certainly wholesome from the taxpayers' point of view.

When you have a grant program and the Federal Government says you can have an outright grant of President Carter's proposals 40 percent of the cost of doing the job, it makes it very much easier not only to fund, obviously, but as a signal to the people who have to make a decision, let's go ahead and do it now, under the initial authorization, let's not wait, let's take charge of it.

Mr. CROSS. The bill, H.R. 5996, requires that regulations be issued by the U.S. Office of Education and contains some language in it about consultation with other agencies. In view of the subject matter of the bill (Energy) I wonder how you must react to having those regulations jointly issued by the FEA and USOE?

Mr. BARDIN. As I understand the concept of President Carter's National Energy Act, the Secretary of Energy, or the FEA administrator under the present law, would consult with the other relevant agencies. We have, of course, in the President's bill, two different kinds of buildings covered. We have the hospitals covered as well as the public and parochial schools covered in the bill. So we would want to have consultation with relevant officials in both cases.

It's certainly very important as a matter of making these programs work that there be communications at all levels, not only within the Federal establishments which sometimes is the hardest to deal with your neighbor, but also with the State governments and the associations of school officials and in developing the President's bill. There has been a meeting and consultation with various people from the school community as well as people knowledgeable in the other Federal department, HEW, on the special aspects of the program.

Mr. CROSS. In developing that bill, were any figures developed on the actual or projected costs necessary to convert or make those "retrofit modifications"? Is there any data base to support the hundred million dollar figure or is it just an arbitrary figure pulled out of the air?

Mr. BARDIN. There have been figures developed which involve very broad ranges. I frankly don't think that anybody could pretend to you that this country at this juncture has a good fix on what it is going to cost per square foot to retrofit the school buildings of America. You can take the low estimate, you can take the high estimate, and they are way apart.

Mr. CROSS. Have those low and high estimates been done?

Mr. BARDIN. They have been done and I am just told that they come to the order of magnitude of estimates as low as 40¢ per square foot to $1 per square foot, and I am not sure but what you could find an even broader range.

Speaking for myself, I would think that the way to get a real handle on the question implicit, the public policy question is to get started on some retrofitting as soon as possible, and to have appropriate people in the school sector and in the engineering world put together actual data.

I don't know that it has to be the Federal Government doing it; it may be trade associations or professional associations. But I remember how data were put together and what it cost to build a natural

gas pipeline in this country from my old days at the Federal Power Commission. The only way to really find out is go build some natural gas pipelines.

The important thing too, is to get this program rolling and that is going to take, as I said before, a strong signal from Washington, the Congress and executive branch as to what President Carter has proposed and what this hearing is all about.

Mr. CROSS. I was struck by the fact I think in two of your statements you opposed the demonstration projects section 5960, on the basis that it is already being done and going on. I think in the dissemination of the results of those demonstrations you have been finding that is terribly important, and I have seen a little bit of that. But I think that perhaps is one of the most essential elements.

Mr. BARDIN. I agree with you. The only point on the legislation, as I understand there is legislation already on the books under which ERDA can do it. But certainly one of the things you want to do is get out the results, things that work, get it out. There are a lot of creative people. There are tens of thousands of creative people in our country. We have to enlist them; we have to enlist the school kids as Commissioner Schmidt says, and as President Carter urged the kids who came to visit him, because that is the way we are going to get it done. It is conceivable that once you get the program really rolling you will find the benefits are so apparent that it's very easy to sell, that once the inertia is overcome, but you don't overcome inertia until you start pushing, and this is the year to start pushing.

Mr. CROSS. I would appreciate your examination of the bill under question here today in terms of the lack of any specificity of the energy savings which might be produced. The bill just calls for some indication that this would be related to energy efficiency, and I don't see anything in the bill that provides for any data on which one could make a basis about where the dollars would best be spent. Anything you would like to comment along those lines or add for the hearing record would be appreciated.

Mr. BARDIN. I think that is covered by President Carter's proposal.

Mr. CROSS. Yes; I am talking about the bill on which the hearing is being held today.

Mr. BARDIN. I agree with you; that is an important aspect of this program.

Mr. CROSS. Mr. Schmidt, I wonder if I might ask you, in terms of declining enrollments that are occurring in school districts now—and I am sure Rhode Island is not immune from that—is energy efficiency a determinant in figuring out what schools to close?

Mr. SCHMIDT. At the present time it is not. Within the next few years we expect that it will be.

Mr. CROSS. Have you had a chance to look at the Carter bill on energy?

Mr. SCHMIDT. No.

Mr. CROSS. Let me tell you it does include a very specific list of these, and Mr. Bardin might be able to show you a copy of it. I see him going through his notebook. There is a very specific list of things which would be eligible for funding. I wonder if this commit-

tee reported a bill, would you have any objection to inclusion of a list of that type rather than the rather indefinite nature of what is in H.R. 5996? It starts on page 44, I think.

Mr. SCHMIDT. I would think generally my background certainly is not a technical competence in this, just simply exposure to a task force of people who are technically competent over several months. I could perhaps comment substantially by mail after I have a chance to review this.

Mr. CROSS. Please, if you would.

I might ask one or two other questions in terms of your study. Have you done any estimates of the costs to retrofit schools in Rhode Island?

Mr. SCHMIDT. No, we do not have those figures available.

Mr. CROSS. The bill authorizes remodelling and renovation. Is it your view that is a necessary part of the energy conservation?

For instance, I think Mr. Bardin mentioned the example of the school district in New Jersey where so much of what was done was done at really very little cost. Remodelling and renovation can be terribly expensive, and can consume dollars in a way that might not be very related to much of a decrease in energy conservation.

Mr. SCHMIDT. I was struck by that testimony too, and I would like to take that question back to my technical people also.

Mr. BARDIN. Could I comment just on that point?

Mr. CROSS. Mr. Bardin?

Mr. BARDIN. The FEA estimate, assuming a 50× cost per square foot of retrofit, and I emphasize the previous answer that we suggest to use caution on the figure, came out to an average of $25,000 for an elementary school, which, of course, is based on assumption of typical square footage.

My friends from West Milford tell me that in that case where they have very cheaply exhausted the first increment of conservation by changing the way in which they operate and maintain their facility, that they are now at the point where they want to go further, but they need a capital project.

They are estimating—and this gives you an indication of the range—somewhere between $10,000 and $25,000.

Mr. CROSS. Per school?

Mr. BARDIN. For the capital improvement.

Mr. CROSS. What do they mean by capital improvement; do you know?

Mr. BARDIN. I don't know which items on this list would be included. I assume it means insulation and weather-stripping the windows, but that is something I don't have.

Mr. LE FANTE. Would the gentleman yield?

Mr. CROSS. Sure.

Mr. LE FANTE. Would it include the installation of new type heating facilities?

Mr. BARDIN. No, it would not include any new furnaces. That would not be proposed the way we have, for example, in the institutional bond issues, when you were Speaker of the General Assembly last year, that would not be included in the West Milford analysis or either of these bills, as I understand it.

Mr. Pulscac advises me that in the West Milford case they are basically looking to installing control equipment.

Mr. LE FANTE. Excuse me?

Mr. BARDIN. To supplement the previous answer to counsel, apparently one of the major components they are looking for now, capital components, is control equipment. I can't speak to the facts in West Milford, but let me speak to a more general situation. You run into this in school buildings and according to Mr. Grogan, the chairman of the Building Trades Council in New Jersey, and we have gone through several years of building what amounts to stripped down schools without insulation.

In addition to that problem, the duct work has been such that instead of recirculating what has already been cooled, we have given it up. We have, in effect, put it out the window. We are running too much fresh air through your buildings, and one of the things we are trying to do under the Energy Production and Conservation Act, EPCA, is developing a State energy conservation plan mandated under EPCA for each State, one component of which could deal with some of these problems in the schools. In fact, the New Jersey plan which was just submitted by the State Energy Office and Governor Byrne under EPCA, includes addressing that kind of problem, to make sure it doesn't happen in the future.

We do the duct work differently and consider at least the retrofitting of some of the buildings as a means of better control of the way we bring in cool air in the winter, and let out cool air in the summer from these buildings.

Mr. CROSS. Something that strikes me is the contrast between the Carter bill and 5996 in terms of the State plan orientation versus the idividual application. Your indication of the New Jersey situation would argue strongly for some sort of State plan in which things could be examined.

Mr. BARDIN. I think that would be very helpful. Dr. Schmidt, I think, made the point very forcefully from the education man's point of view. I do want to emphasize I have worked with several different programs in my last few years as Commissioner of Environmental Protection in New Jersey. I think the State plan we have to develop for us of our water pollution money is an extremely salutary discipline for ourselves and how we operate.

Of course, we take account of priorities within the State and the geographic and demographic priorities of the State which might be different from a remote State in the country.

There have been other programs including ones recently funded where there has been a great deal of heartache, quite frankly, because of the lack of a coherent priority system in which the funds have been distributed. So I think that is something we will focus on quite carefully as the Congress develops and enacts this legislation.

Mr. CROSS. Thank you, Mr. Chairman.

Mr. LE FANTE. Mr. Bardin, the Administration bill would include schools and hospitals, would it not?.

Mr. BARDIN. That is correct.

Mr. LE FANTE. It's my understanding there is a $300 million budget for that program.

Mr. BARDIN. There is $300 million authorized each year starting in fiscal year 1978 for a period of three years.

Mr. LE FANTE. Could you tell the committee how far that $300 million per year would go on a nationwide basis? I notice in your testimony on page 4, you state, "During the past winter over 40 million pupil days were lost."

Mr. BARDIN. Right.

Mr. LE FANTE. At the bottom of the page you have an estimated cost value attached to that, which represents approximately 43,000 teaching positions at current salary rates.

In New England, the medium expenditure for oil, the major heating fuel, increased 136 percent from $11.23 per pupil to $26.45.

Mr. BARDIN. Right. That was not last winter; that was two winters previous, before all of the additional effects. So last winter would be considerably higher.

Mr. LE FANTE. Okay. Down at the bottom of page 5, your second step is implementation of capital improvements, to increase the overall energy efficiency, which is what we are talking about now. You would have to first, I imagine, estabish priorities. Into what areas would the Administration bill or regulations direct the first $300 million which would be going into areas such as you describe in your testimony?

Mr. BARDIN. Yes. Under the Administration bill, the formula for allocation of the $300 million had each year amongst States would take account of climatic differences and such differences among others.

Two, the priority, each State would have to develop a priority system which took account of the varied needs within that State; it couldn't all be loaded in one geographic end of the State or another, or one aspect of the State, and assuming—counsel previously raised the question as to the constitutional extent to which these funds can be made available to the non-public schools, the parochial schools—but assuming you have an extent to which that can be done, as I believe is the case, you have to have an equitable arrangement in that regard too.

Going to your first question, I think I have to say that any figure I gave you as to the total job to be done would be liable to great uncertainty because of the fact you don't have practical, real world experience here. You are coming up with these wide ranging estimates of 40¢ a square foot to $1 a square foot, and perhaps even more as the basis. Once you have some practical experience, you have a better idea what it would cost to insulate a given group of thousands of school buildings.

There are two other questions that would remain. That would be the question: What is the most cost effective schools or choices to work on first? I believe that the system of audits that has already been started under EPCA will create a technology by which States and commissioners of education will be able to go and survey their schools and decide where it is important to go first and where you go second.

Finally, there will be the question of how much incentive you have to maintain, for how long you have to maintain it at the Federal level. You want to create a climate in which people are rushing into the program just as fast as they prudently can. You don't want to give anybody encouragement to delay.

On the point about what the school administrators can do, you will recall we had some concern about asbestos flaking in schools in New Jersey. One of the things that very much impressed me from that experience in working with the Commissioner of Education and his staff, was the speed and the professionalism and soundness with which they could reach out to schools throughout the State, survey what the condition was, rank and condition from extreme to problematical, to completely stable, so that a priority approach could be developed and a time-table developed for doing that.

I think you want to take advantage of that kind of governmental institutions that have built up in the States to help set the priorities of where we spend the money first.

I wouldn't hold up any district from going ahead on its own if it wanted to. But where these Federal funds are made available—and I hope will be made available quickly—that would be a very good way of getting the job done.

Mr. LE FANTE. Talking about availability of Federal funds, I want to get back to part 2 of my question, or at least make an observation. Let's assume that because of the news media and preliminary publicity as a result of these hearings, administrators such as Dr. Schmidt and others throughout the country begin to put a program together for their Governors. Let's assume further that this legislation becomes law and that in a matter of 60 days the Federal Government is flooded with approximately 750 million applications.

At this point we only have $300 million to spend the first year. What would the criteria be as far as the Administration is concerned in establishing priorities to spend the first $300 million?

Mr. BARDIN. The bill requires that the criteria be prescribed and I am not the right person to answer the question if there is one in being today. It would be the official in charge of the conservation program who would prepare criteria. The bill provides a timetable longer than the one that you suggest, Congressman, for developing it, and obviously one of the reasons for taking more time is so you could have consultations with the people in the school sector, the associations, the people in the States as well as the people in the Department of Health, Education and Welfare in developing criteria.

My own feeling is that we are not going to have that problem, not the first year. I don't know what is going to happen the second year.

If you recall what our problem was with the water pollution control funds that Congress made available in 1972, they just weren't going, and it took a good powerful kick and powerful administrative decision, we were going to clean up that water pollution and going to put this money to work to get us to the point where we are today in 1977, wherein New Jersey is one of the States that has used up its money or actually committed all of its money, so the projects will be built over the next two or three years.

I think you are going to find responsible school administrators are the same way. Under the President's bill they have to raise 60 percent and perhaps the State will step in with a bond issue or otherwise, and aid them in raising the non-Federal share. But, there is going to be a budget process at the local level, and they are not going to go in and just say give me, without thinking through

what they are doing. I am not worried about that. I am much more worried about the other problem, the inertia, getting the applications flowing in, getting them started.

I think if you set up a hodgepodge program with no standards, yes, you might have a lot of applications, but if you set up a serious program which is addressed to serious people such as Commissioner Schmidt's and the school districts that lay behind or above or beside the State commissioners, I think the trick is to start the ball rolling rather than control that great flood of applications.

Mr. LE FANTE. Thank you, Mr. Bardin.

Does anyone else have any questions of this panel?

I would like to take this opportunity, David, to personally welcome you here. I have worked with David Bardin the past four years in New Jersey and I can honestly say it has probably been one of the most educational and informative experiences in my life to be associated with him.

New Jersey's loss is the Nation's gain, and I know he is going to continue at the national level the good work he has done at the State level. I can't even begin to tell you how happy and pleased I am to have him in Washington.

Welcome, David.

Mr. BARDIN. Thank you very much, Mr. Speaker, if I may address you one last time by that title. I want you to know that this is my maiden appearance before a congressional committee, and it couldn't be a greater pleasure for me to appear before you in my first testimony on behalf of the Federal Energy Administration, and advocate the Administration's position on this very key program we are going to work on together and address together and get moving on together.

Thank you, Mr. Chairman.

Mr. LE FANTE. There being no further witnesses this morning, we will recess until 1:00 p.m., at which time we will have the last panel of the day.

Thank you all for attending.

[Whereupon, at 11:30 a.m. the committee recessed to reconvene at 1:00 p.m.]

AFTERNOON SESSION

Chairman PERKINS. The committee will come to order.

We have with us Dr. Thomas McKittrick, AIA, Chairman, Energy Subcommittee, Architecture for Education, American Institute of Architects; Mr. Richard T. Scott, Chairman, Energy Committee, Mechanical Contractors Association of America; Mr. H. Harry Phipps, PE, Chloride America, Inc. Member, National Society of Professional Engineers, and Mr. Steven Hychka, Director of the Energy Task Force, American Council on Education.

All you gentlemen will be heard from.

Mr. Thomas McKittrick, go ahead. Without objection, all your prepared statements will be inserted in the record.

STATEMENTS OF THOMAS McKITTRICK, CHAIRMAN, ENERGY SUBCOMMITTEE, ARCHITECTURE FOR EDUCATION, AIA; RICHARD T. SCOTT, CHAIRMAN, ENERGY COMMITTEE, MECHANICAL CONTRACTORS ASSOCIATION OF AMERICA, ACCOMPANIED BY WILLIAM C. ABERNATHY, MCAA STAFF; H. HARRY PHIPPS, PE, ENERGY MANAGER, CHLORIDE AMERICA, INC., MEMBER, NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS, AND STEVEN HYCHKA, DIRECTOR, ENERGY TASK FORCE, AMERICAN COUNCIL ON EDUCATION, ASSOCIATION OF PHYSICAL PLANT ADMINISTRATORS, NATIONAL ASSOCIATION OF COLLEGE AND UNIVERSITY BUSINESS OFFICERS

STATEMENT OF THOMAS McKITTRICK

Mr. McKITTRICK. Thank you, Mr. Chairman.

Mr. Chairman and members of the subcommittee, my name is Thomas McKittrick, AIA. I am a practicing architect in Houston, Texas, and I appear before you today on behalf of the American Institute of Architects; the national society for the architectural profession, to give our views on H.R. 5996, a bill to assist schools to conserve energy. I currently chair the Energy Subcommittee of the Architecture for Education Committee of the AIA.

The AIA has been actively advocating energy conservation in buildings for several years now and we commend this subcommittee for the initiative in this direction shown by H.R. 5996. I will not list all of the institute's activities in the area of energy conscious design, but only state that we, our chapters, and individual members are working intensively with Federal, State, and local government agencies in developing conservation plans and strategies. At the same time, the institute is carrying on continuing education and research efforts directed at our own members to increase the overall knowledge and competency of our profession to deal with the energy issue.

We have two primary concerns with H.R. 5996 and some miscellaneous comments.

Our first concern is that the eligible uses of basic grant funds, as described in section 1002 and 1004, are largely undefined. The term used to denote eligible uses, "energy conservation measure," is not defined in the bill and there is no provision for authenticating that proposed energy conservation measures will indeed save energy. The only requirement is that the applications for the grants require procedures to evaluate the effectiveness of the grants without providing any criteria or guidelines.

Having worked on these issues for years, we can assure you that the problems involved are far more difficult and complex than indicated by these sections of the bill. To avoid abuse and failure of this much-needed program, the legislation should set out requirements to address the following issues:

1. How much energy must be saved or how cost-effective must a measure be to qualify for federal funding? It would be unfortunate if large amounts of money were spent for relatively little energy saving. Provisions addressing this issue should discuss energy audit procedures and the qualifications of persons competent to perform them.

2. Some definition of which of the many energy cost forecasts are to be used in evaluating energy conservation measures should be given and some requirement for avoiding undesirable fuel conversions, such as from gas to oil or electricity rather than to coal or solar power, should be included.

3. This bill, in effect, sets up a new $1.4 billion construction grant program. Some description is needed as to how and by whom such a sizable public works program is to be administered, what role State and local governments are to play, and what limits are intended on the commissioner's discretionary powers.

Our second primary concern with this bill is that it appears to set up a program in the area of energy conservation that will largely parallel programs in the Commerce Department and the Federal Energy Administration. The new expanded public works program in Commerce, for which schools are eligible, will contain a new priority for energy-conserving building modifications. FEA is gearing up for a loan guarantee program that was authorized last August. Setting up a third separate program, as justifiable as it may be, in the Office of Education within HEW may result in local officials being faced with mutiple and possibly even conflicting conservation requirements.

We strongly urge the committee designing this grant program, targeted at schools with their special needs, to be as coordinated and complimentary with these other programs as possible.

The most attractive means to address the two concerns outlined above is to adopt by reference into this bill relevant portions of part B of Title IV of the Energy Conservaton and Production Act of 1976, Public Law 94-385. Many of the problems confronting a program of energy conservation retrofits for buildings were legislatively resolved in this law. The statute provides careful definitions for the terms "energy conservation measure" and "energy audit." It also establishes a mechanism of supplementary State plans to administer and enforce such programs at the State level.

The only significant change we would recommend in the definitions available to be used from that law in supplying them to schools is deletion of the requirement that the pay-back period for conservation measures be 15 years or less. Schools generally have longer useful lives than commercial buildings. It is also frequently more difficult to accurately measure schools' energy use patterns because they seldom have the adequate monitoring equipment common to commercial buildings. It is therefore more difficult to predict precise pay-back periods for a given energy conservation meaure.

A major benefit to be derived from adopting the definitions and certain procedures from Public Law 94-385 into this bill would be the time and effort saved in implementing the special school retrofit program. FEA has already published extensive proposed rules under this law on April 25 and most states are well under way in their State plans. Incorporating this work into H.R. 5996 could then save as much as a year in getting the school program operational, as well as avoid duplication of effort and possible conflict.

Our remaining comments go to the technical assistance program in section 1997. This section refers to technical assistance being

provided by specially qualified personnel. We are somewhat concerned that the new emphasis and funding for energy conservation in buildings may spawn a corps of instant energy experts. We suggest that some minimum level of qualifications be required of those providing technical assistance, as FEA has established for persons conducting energy audits. In addition, we suggest the word "design" be added after the word 'planning' at line 10 on page 8 of the bill.

Finally, we ask that architects be included along with professional engineers in the consultative group for the commissioner on this program, by adding "architects" on line 24, page 11.

The special funding program this bill would set up could provide significant help to the country's schools in meeting the energy cost problems they are confronting. While schools are eligible for Federal assistance for energy conservation under other programs, none of these programs provides direct capital funding and schools must compete against many other applicants. A funding program specifically targeted at schools, with their particular problems in financing and decentralized oeprations, can therefore be justified.

We believe the state of the art in applying energy conservation measures to educational facilities will permit a rapid, effective utilization of the programs in H.R. 5996. There already exist several commercially available computer analysis programs which, for a nominal cost, can tell school officials if their energy use is normal or out of line with what could be achieved. These tools will at least indicate which school systems are prime candidates for participating in the program. AIA has been working to buttress the data base for these kinds of analyses, and we would like to submit for the record a draft guide on energy use data, which includes material on schools.

The Buildings Systems Information Clearinghouse of the Educational Facilities Laboratories in California has also published useful workbooks and case studies. And finally, the National Science Foundation has sponsored an extensive study of energy conservation in school bulding design, conducted by an architect expert in the field, Mr. Richard G. Stein, FAIA. We understand that the final report is due this week. With these types of tools and a rapidly growing bank of knowledge and experience in making our schools energy-efficient we believe a funding program in this area can be effective and we endorse the concept.

I want to thank you for the opportunity to testify and I would be glad to answer any questions you may have.

[Statement follows; attachment to statement retained in subcommittee files]

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THE AMERICAN INSTITUTE OF ARCHITECTS

ENERGY CONSERVATION IN SCHOOLS

A STATEMENT BY

THOMAS McKITTRICK, AIA

VICE CHAIRMAN

ARCHITECTURE FOR EDUCATION COMMITTEE

THE AMERICAN INSTITUTE OF ARCHITECTS

TO

SUBCOMMITTEE ON ELEMENTARY AND SECONDARY SCHOOLS

COMMITTEE ON EDUCATION AND LABOR

UNITED STATES HOUSE OF REPRESENTATIVES

WASHINGTON, D.C.

May 3, 1977

1735 NEW YORK AVENUE, N.W. • WASHINGTON, D. C. 20006 • (202) 785-7300

Mr. Chairman, and members of the Subcommittee, my name is Thomas McKittrick, AIA. I am a practicing architect in Houston, Texas and I appear before you today on behalf of the American Institute of Architects, the national society for the architectural profession, to give our views on H.R. 5996, a bill to assist schools to conserve energy. I currently chair the Energy Subcommittee of the Architecture for Education Committee of the AIA.

The AIA has been actively advocating energy conservation in buildings for several years now and we commend this Subcommittee for the initiative in this direction shown by H.R. 5996. I will not list all of the Institute's activities in the area of energy-conscious design, but only state that we, our chapters, and individual members are working extensively with federal, state, and local government agencies in developing conservation plans and strategies. At the same time, the Institute is carrying on continuing education and research efforts directed at our own members to increase the overall knowledge and competency of our profession to deal with the energy issue.

We have two primary conerns with H.R. 5996 and some miscellaneous comments.

Our first concern is that the eligible uses of basic grant funds, as described in Section 1002 and 1004, are largely undefined. The term used to denote eligible uses - "energy conservation measure" - is not defined in the bill and there is no provision for authenticating that proposed energy conservation measures will indeed save energy. The only requirement is that the applications for the grants require procedures to evaluate the "effectiveness" of the grants without providing any criteria or guidelines.

Having worked on these issues for years, we can assure you that the problems involved are far more difficult and complex than indicated by these sections of the bill. To avoid abuse and failure of this much needed program, the legislation should

set out requirements to address the following issues:

1. How much energy must be saved or how cost effective must a measure be to qualify for federal funding? It would be unfortunate if large amounts of money were spent for relatively little energy saving. Provisions addressing this issue should discuss energy "audit" procedures and the qualifications of persons competent to perform them.

2. Some definition of which of the many energy cost forecasts are to be used in evaluating energy conservation measures should be given and some requirement for avoiding undesirable fuel conversions, such as from gas to oil or electricity rather than to coal or solar power, should be included.

3. This bill, in effect, sets up a new $1.4 billion construction grant program. Some description is needed as to how and by whom such a sizeable public works program is to be administered, what role state and local governments are to play, and what limits are intended on the Commissioner's discretionary powers.

Our second primary concern with this bill is that it appears to set up a program in the area of energy conservation that will largely parallel programs in the Commerce Department and the Federal Energy Administration. The new expanded public works program in Commerce, for which schools are eligible, will contain a new priority for energy conserving building modifications. FEA is gearing up for a loan guarantee program that was authorized last August. Setting up a third separate program, as justifiable as it may be, in the Office of Education within HEW may result in local officials being faced with multiple and possibly even conflicting conservation

requirements. We strongly urge the Committee design this grant program -- targeted at schools with their special needs -- to be as coordinated and complimentary with these other programs as possible.

The most attractive means to address the two concerns outlined above is to adopt by reference into this bill relevant portions of Part B of Title IV of the Energy Conservation and Production Act of 1976, Public Law 94-385. Many of the problems confronting a program of energy conservation retrofits for buildings were legislatively resolved in this law. The statute provides careful definitions for the terms "energy conservation measure" and "energy audit." It also establishes a mechanism of supplementary state plans to administer and enforce such programs at the state level. The only significant change we would recommend in the definitions available to be used from that law in applying them to schools is deletion of the requirement that the pay-back period for conservation measures be 15 years or less. Schools generally have longer useful lives than commercial buildings. It is also frequently more difficult to accurately measure schools' energy use patterns because they seldom have the adequate monitoring equipment common to commercial buildings. It is therefore more difficult to predict precise pay-back periods for a given energy conservation measure.

A major benefit to be derived from adopting the definitions and certain procedures from P.L. 94-385 into this bill would be the time and effort saved in implementing the special school retrofit program. FEA has already published extensive proposed rules under this law on April 15 and most states are well under way in their state plans. Incorporating this work into H.R. 5996 could then save as much as a year in getting the school program operational, as well as avoid duplication of effort and possible conflict.

Our remaining comments go to the technical assistance program in Section 1007. This section refers to technical assistance being provided by "specially qualified personnel." We are somewhat concerned that the new emphasis and funding for energy conservation in buildings may spawn a corp of instant energy experts. We suggest that some minimum level of qualifications be required of those providing technical assistance, as FEA has established for persons conducting energy audits. In addition, we suggest the word "design" be added after the word "planning" at line 10 on page 8 of the bill.

Finally, we ask that architects be included along with professional engineers in the consultative group for the Commissioner on this program, by adding "architects" on line 24, page 11.

The special funding program this bill would set up could provide significant help to the country's schools in meeting the energy cost problems they are confronting. While schools are eligible for federal assistance for energy conservation under other programs, none of these programs provides direct capital funding and schools must compete against many other applicants. A funding program specifically targeted at schools, with their particular problems in financing and decentralized operations, can therefore be justified.

We believe the state of the art in applying energy conservation measures to educational facilities will permit a rapid, effective utilization of the programs in H.R. 5996. There already exist several commercially available computer analysis programs which, for a nominal cost, can tell school officials if their energy use is normal or out of line with what could be achieved. These tools will at least indicate which school systems are prime candidates for participating in the program. The

AIA has been working to buttress the data base for these kinds of analyses, and we would like to submit for the record a draft guide on energy use data, which includes material on schools. The Building Systems Information Clearinghouse of the Educational Facilities Laboratories in California has also published useful workbooks and case studies. And finally, the National Science Foundation has sponsored an extensive study of energy conservation in school building design, conducted by an architect expert in the field, Mr. Richard G. Stein, FAIA. We understand that the final report is due this week. With these types of tools and a rapidly growing bank of knowledge and experience in making our schools energy efficient, we believe a funding program in this area can be effective and we endorse the concept.

I want to thank you for the opportunity to testify and I would be glad to answer any questions you may have.

Chairman PERKINS. We are going ahead to the next witness first before we question the panel.

Go ahead, the next gentleman. Mr. Scott, go ahead.

STATEMENT OF RICHARD T. SCOTT

Mr. SCOTT. Mr. Chairman and members of the subcommittee, the Mechanical Contractors Association of America, known by its initials MCAA, appreciates this opportunity to present our statement in support of H. R. 5996.

MCAA is a construction trade association of about 1500 firms, employing approximately 125,000 persons. Almost all of the firms employ union labor.

I am Richard T. Scott, a mechanical contractor from Omaha, Nebraska. I am accompanied by William C. Abernathy of the MCAA national staff.

You have our full written testimony in support of H.R. 5996 which I would like to summarize at this time.

[Prepared statement of Richard T. Scott follows:]

MECHANICAL CONTRACTORS ASSOCIATION
OF AMERICA, INC.

Suite 750, 5530 Wisconsin Ave., Washington, D.C. 20015
Tel. (202) 654-7960 TWX: 710-825-0423

STATEMENT ON
H.R. 5996
BY THE
MECHANICAL CONTRACTORS ASSOCIATION OF AMERICA, INC.
TO THE
SUBCOMMITTEE ON ELEMENTARY, SECONDARY AND VOCATIONAL EDUCATION
OF THE
HOUSE COMMITTEE ON EDUCATION AND LABOR
May 3, 1977

Mr. Chairman and Members of the Subcommittee:

The Mechanical Contractors Association of America, known by its initials MCAA, appreciates this opportunity to present our statement in support of H.R. 5996.

MCAA is a construction trade association of about 1500 firms, employing approximately 125,000 persons. Almost all of the firms employ union labor. I am Richard T. Scott, a mechanical contractor from Omaha, Nebraska. I am accompanied by William C. Abernathy of the MCAA national staff.

A mechanical contractor builds systems that move fluids, both liquid and gas. This includes the fabrication and installation of heating, ventilating, air conditioning and process piping systems, and further encompasses service, maintenance and the testing, adjusting and balancing of these systems. Our work affects multi-residential, commercial, public and industrial facilities. The equipment our members install is the principal user of energy in buildings, and energy is the key to our industry. Consequently, conservation and effective use of our nation's fuel resources are and have been concerns of MCAA. We have extensive experience and know-how in this field. Even before the OPEC oil embargo in 1973, MCAA had formed an Energy Conservation Committee to inform and assist our members in the areas of energy conservation. Two of our publications on this subject are enclosed with this statement.

MCAA has evaluated H.R. 5996 as introduced. Further, our representatives participated in a conference, conducted by the American Association of School Administrators and other interested parties, where a similar bill, S.701 was analyzed, and measures for practical implementation were discussed.

Based on our study of the bill and the results of the AASA conference, we believe

that the legislation can make a significant contribution toward the nation's energy conservation effort. For that reason, the bill and its objectives have MCAA's strong backing. We offer these supporting comments:

First, H.R. 5996 provides incentives to encourage energy conservation in institutions in every community in the nation. We fully recognize that the inevitable and continuous rise in fuel bills eventually will force schools to undertake energy conservation. However, the assistance provided through grants can permit school administrators to move into more extensive conservation programs now.

The grants for building retrofit can produce immediate benefits in selected buildings. Results and lessons learned from these relatively few buildings can provide incentives and practical experience that school districts can apply to other buildings, perhaps using their own funds.

We also believe the bill is timely. The severe winter of 1976-1977 has presented the most dramatic demonstration of our national vulnerability in energy since the OPEC embargo. The inordinate demand for fuel, the shortages and rising prices are felt by practically everyone. H.R. 5996 offers a helping hand to schools, hard hit by energy costs and other problems. Further, that assistance is accompanied by funds that will enable schools to avoid diverting money from educational programs into meeting the increased operating costs. The bill certainly is in consonance with the Administration's energy program as announced by President Carter on April 20.

The technical competence to accomplish energy conservation in buildings is available immediately. Mechanical contractors and others in the construction and engineering fields are well aware of the technology and procedures to make buildings more energy efficient. Many of our own MCAA members are confident that they can readily achieve reductions in energy consumption in most industrial, commercial and public buildings by 20-25% or more.

This legislation can help teach an important lesson. Even with increasing fuel prices building owners in the public and private sectors believe that funds are better expended to purchase relatively low-cost fuels and for other purposes rather than for basic renovation of equipment and facilities. H.R. 5996 helps schools to teach the wisdom of energy conservation without curtailment of other school services.

Further, we believe that the energy conservation programs promoted by this program will be successful and that the adage of "success succeeding" will again be proved. The work accomplished will have long lasting results on the buildings selected for energy improvement measures. Where a money-saving procedure works, the word spreads rapidly. When schools, a very visible part of the public domain, can demonstrate the effectiveness of energy saving measures, the lesson will not be lost on families of the students and the private sector. The proven techniques certainly can be applied elsewhere and undoubtedly will be.

This legislation will provide a stimulus to construction, which overall is still a depressed industry. The mandatory distribution of the grant monies will create jobs throughout the country. In addition, if projects stimulate similar actions by local business and industry as we expect, additional work and jobs will be created by private funding. The bill, therefore, can have a positive near term and long-range economic effect. For the near term, jobs will be created; in the long-range, conservation now can help assure energy for jobs in the future.

The wording of the bill provides latitude in choice of alternatives for energy conservation measures in each building. This is an advantage as various alternatives and combinations are available for application to each building. The measures for conservation in existing structures generally fall into four major categories:

1. Changes to make building operating procedures more efficient.
2. Improvements in temperature control systems.
3. Increasing the efficiency of the mechanical equipment.
4. Making the building structure more energy efficient.

For most buildings, applying any one of the above, if properly selected, will make a significant contribution to reducing fuel consumption. A combination of two or more, again carefully selected, can promote additional savings. Costs of the work and its effectiveness will vary so widely that alternatives can be determined only on a case-by-case basis. Such variables as the age of the building, occupancy patterns,

climatic region and architectural style will have an effect. As a general rule, however, the costs and economic feasibility of the alternatives will follow the pattern of the schematic graph shown on Enclosure 1.

Case studies reflecting costs and potential savings in school buildings have been developed by the American Association of School Administrators (AASA) in conjunction with a demonstration project with 10 schools. I assume this data will be made available to your Committee by AASA.

Federal funding will permit school districts latitude in applying different approaches to find the most feasible ones. One of the benefits of the proposed program is that conservation work can be performed on one or two buildings in a region to help prove what alternates produce best results. In other words, schools can test and see where the economic paybacks are for each area of the country where climate and architectural styles may differ. Perhaps more important is the continuing nature of energy improvements ----- the efficiencies will remain with each building even after the Federal funds have been expended.

We recognize that some persons may consider that the monetary cost of this program may be too high for expected results. But the consequences to our country of not moving immediately and aggressively into an effective energy conservation program can have far more serious implications than money can cure. What is the value to the nation today of a barrel of oil not imported? Or what will be the 1995 value to the nation of a barrel of oil or cubic foot of gas not burned in the 1970's? MCAA does not know the precise answers to those questions, but does suggest that an investment today that will save and provide energy sources for tomorrow is prudent.

Another area of concern to this industry is the matter of incentives. MCAA contends that with proper incentives, U.S. business and industry can solve our entire energy conservation problem , since adequate knowledge and technology for energy conservation is already in hand. H.R. 5996 is an incentive for school administrators. What has been and still is lacking is sufficient motivation and capital for others to implement energy conservation extensively. As one way of providing more significant motivation, MCAA has developed a unique plan for tax incentives to homeowners, business and industry for energy conservation. It has a tremendous advantage of providing tax credits

to homeowners and commercial and industrial owners based on the amounts of fuel saved, rather than capital outlays alone.

Since your Subcommittee does not deal directly with business tax matters, details on this will not be covered at this time. Suffice to say, that MCAA's tax incentive plan is relatively simple and as we believe, workable. We have attached a one-page explanation of this plan as part of this statement, at Enclosure 2.

SUMMARY

To summarize, the Mechanical Contractors Association of America supports H.R. 5998 for the following reasons:

1. It provides incentives and assistance to encourage energy conservation in buildings used by a significant segment of the public across the country.

2. The bill is timely. There is an immediate and urgent need for an extensive energy conservation program nationally. The severe 1976-1977 winter has made much of the population aware of that fact.

3. The bill will bring into operation some of the extensive talent, know-how and technology for energy conservation presently available in the business, industrial and public sectors.

4. By demonstration and positive results, the program can have effects reaching into the private sector.

5. The money invested in energy conservation now can pay significant dividends in the future by helping assure future supplies of energy.

6. Productive, worthwhile work and jobs will be created now, with potential for increasing such work in the future, as energy conservation moves to other school buildings and construction in the private sector.

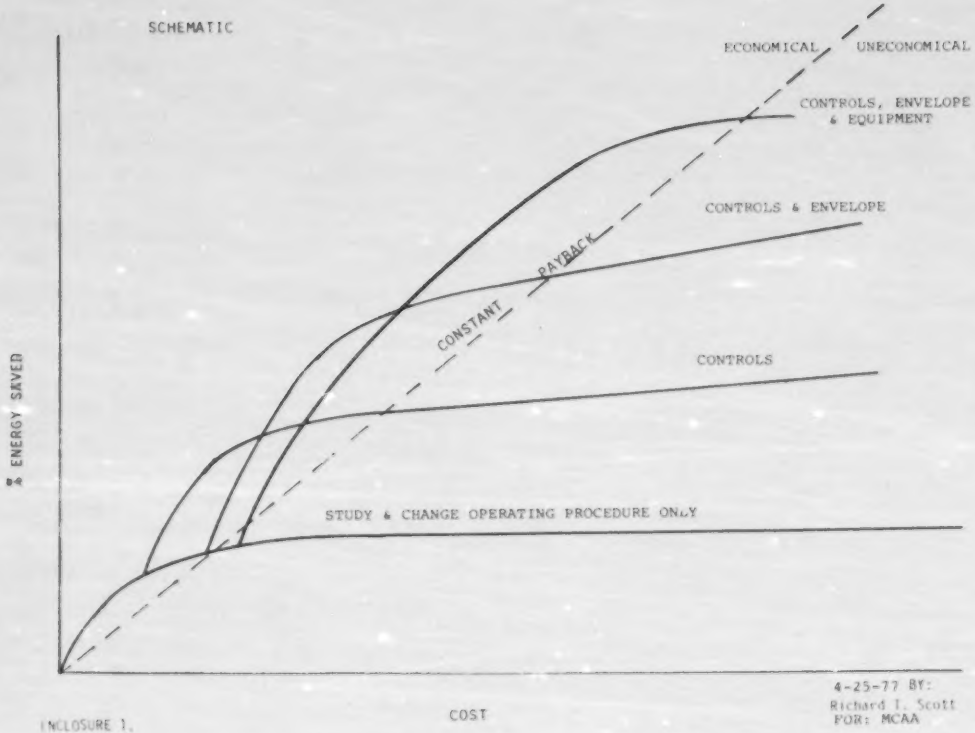
7. The program can help verify the most promising energy conservation alternatives for buildings in various regions of the nation.

8. A demonstration of what one type of incentive can accomplish may encourage the Congress to provide other types, such as tax incentives, to encourage intensive energy conservation by homeowners, business and industry.

MCAA appreciates this opportunity for comment. We will be pleased to provide additional comments and details as may be needed.

****

Enclosures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4-25-77 BY:
Richard I. Scott
FOR: MCAA

INCLOSURE 1.

MECHANICAL CONTRACTORS ASSOCIATION
OF AMERICA, INC.

Suite 750, 5530 Wisconsin Ave., Washington, D.C. 20015
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MECHANICAL CONTRACTORS ASSOCIATION OF AMERICA
PROPOSED
TAX CREDIT FOR ENERGY SAVING IMPROVEMENTS
IN EXISTING
COMMERCIAL/INDUSTRIAL BUILDINGS

ASSUMPTIONS:

1. There is no shortage of know-how in the U.S. private sector to achieve substantial actual energy savings, given proper incentives.

2. The incentives should be based on the principle of predictable results in energy savings.

3. The principles should be sufficiently broad and flexible to encourge full use of the inherent ingenuity of the U.S. private sector.

4. Energy savings can be accurately forecast by a qualified Registered Professional Engineer.

5. A certification by a Registered Professional Engineer will be as valid for the returns as a certification by a Certified Public Accountant.

6. The concept of tax incentives should be based on the principle that for each barrel of oil saved, an equivalent tax credit is given. (The equivalent can be applied to other fuels.)

7. The per barrel value of oil would be determined annually by the Secretary of Commerce based on world wide prices and value of saving to the national economy.

METHOD

Objective: To encourage energy saving investments through tax incentives based on the total amount of fuel saved and/or the capital expenditure involved.

1. Provide 12 percent investment credit for the installation of energy saving equipment. Further, provide additional tax credit for amount of electrical-generated energy or petroleum-generated energy (including natural gas) saved. Suggested method:

   a. Total annual energy savings based on energy saving property be calculated and certified by a Registered Professional Engineer.
   b. Convert savings to oil equivalent barrels of energy.
   c. Determine actual dollar value of a barrel of oil (Secretary of Commerce).
   d. Allow tax credit to be equal to number of oil-equivalent barrels saved, multiplied by dollar value of barrel of oil.
   e. Allow the calculated credits to be applied annually for a specified number of years.

2. As an alternative, eliminate investment credit for energy saving equipment and apply principles of paragraphs 1a, b, c, d, e as tax incentives.

MCAA OF AMERICA Energy Conservation Committee BULLETIN

January, 1976

Subject: ENERGY CONSERVATION SERIES

Dear MCAA Member:

The MCAA Energy Conservation Committee is convinced that there is work available for MCAA members in the field of mechanical retrofit. This area has become increasingly important as a result of the present and projected energy situation.

The cost of all forms of energy went up dramatically in 1974, and we see no prospect that these costs will be reduced anytime in the immediate future. The higher cost of energy and the accompanying heating/cooling costs make it well worthwhile for building owners to look at existing mechanical systems and consider measures for greater efficiencies and accompanying lower fuel costs. All of us are well aware that such a hard look was not practiced as recently as three years ago when energy was plentiful at relatively low cost. That situation has changed dramatically and has provided us with new opportunities for business.

The Committee as a continuing project will suggest measures and considerations for mechanical component retrofit to upgrade existing systems. We addressed this subject generally in our January 1975 publication "Energy Conservation=Opportunity for Mechanical Contractors". Our new efforts will present ideas and suggestions in more detail. Each bulletin will include, where feasible, typical examples and general calculations for savings that can be achieved in the areas covered. They will be kept succinct, but still cover the subject.

Some of the publications will be based on materials provided the Committee at a manufacturers conference arranged through Air Conditioning and Refrigeration Business Magazine (July 1975 issue).

The first of these bulletins is attached. It discusses use of activated charcoal filters for energy conservation in existing as well as new buildings. We will distribute similar bulletins on other topics subsequently.

THE MCAA ENERGY CONSERVATION COMMITTEE

Carl J. Bruechert, Chmn.
Lester Gross
L. Nelson Hopkins, Jr.
Eugene J. Maupt
George M. Rozzell, Jr.
Richard T. Scott

Suite 750, 5630 Wisconsin Ave., Washington, D.C. 20015

MCAA ENERGY CONSERVATION COMMITTEE

ENERGY CONSERVATION SERIES NO. 1

January, 1976

ACTIVATED CHARCOAL FILTERS

The increased cost of energy today and realistic forecasts for additional increases in the future, together with accountability requirements of an energy balance for future construction make feasible a re-examination of the application of activated carbon filters as a positive means for energy conservation.

Inexpensive energy costs of the past have created certain accepted practices regarding the amount of "fresh air" or outside air required for heating, ventilating and cooling installations.

In many areas, building codes have incorporated minimum outside air requirements related to occupancy. New evaluations brought on by the need to make buildings more efficient energy users have shown that in many cases, buildings bring in far more outside air than needed. To get this outside air properly conditioned for the building climate takes a lot of energy. This is where activated charcoal filters can be valuable.

Activated carbon filters have been used for many years, principally where the outside or return air has been contaminated by local obnoxious odors.

However, these devices can be used to "re-condition" inside air, permitting it to be recirculated. This in turn reduces the need for bringing outside air.

The quantity of outside air actually required for most installations can be limited to the amount exhausted (toilet areas) plus an additional small amount to pressurize the building. Even in hospital operating rooms some local codes now permit recirculating a large percentage of air used in operating rooms. There is, of course, a need to check local codes for outside air requirements, but the energy situation is resulting in making outside air requirements less stringent in many locales.

Savings in heating and cooling operating costs for reduction of each 1000 CFM of outside air are summarized in Enclosure 1 and the means of calculation shown in Enclosure 2. They may be surprising.

The calculations show savings in operating costs only, but additional economies can be realized. When activated carbon filters are used in a new installation, the reduction in heat loss, and the heat gain can reduce the size of the required support equipment; i.e. boilers, air-handling installation and refrigeration equipment, with corresponding savings in the original contract amount.

SUMMARY – Activated Charcoal Filters

Advantages

1. Activated charcoal filters can be installed and achieve energy savings in certain existing and new HVAC systems.

2. The fuel savings per 1000 CFM of outside air reduction can be readily calculated.

3. Filters provide savings in sensible heat that is part of the outside air load.

4. Depending upon specific application, filter systems can provide savings comparable to closed loop and heat pipe recovery systems.

5. The filters are effective deodorants.

Cautions

1. In some localities the filter systems may conflict with codes that require make-up air. Local codes must be checked.

2. The filters require a relatively large amount of space.

3. The filters require systematic monitoring to determine saturation level from contaminants and need for replacement.

4. Use of the filters will conflict with an economizer control system.

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2 Enclosures

CALCULATED SAVINGS

WITH THE REDUCTION OF EACH 1,000 C.F.M. OF OUTSIDE AIR:

During Heating Season

Heat loss can be reduced by 75,600 BTU/HR.

530 Gallons of oil per year can be saved.

585 Therms of gas can be saved.

2750 KWH of electricity can be saved.

During Cooling Season

Heat gain can be reduced by 16,200 BTU/HR., sensible, and 26,950 BTU/HR. latent.

Annual tonnage of 5970 tons of refrigeration can be conserved.

4,475 KWH of electricity can be saved yearly.

1,000 C.F.M. of activated charcoal filter capability will cost approximately $104.80 per year installed and maintained, taking into account depreciation of original investment. (Note)

NOTE: Cost based on current prices of equipment and installation costs financed at 10% interest over a 10 year life cycle.

Enclosure 1

2

METHOD OF CALCULATION

During Heating Season:

Equation 2. Page 646, 1968 ASHRAE GUIDE

Heat Loss = C.F.M. x 1.08 (Indoor design temp. - outdoor temp.)

= 1,000 x 1.08 x 70

= 75,600 BTU/HR.

Equation 1. Page 646 of 1968 ASHRAE GUIDE

$$F = \frac{XN}{C \times E}$$

F = Quantity of fuel or energy required (gal. of oil)

X = Average winter heat requirements.

N = Number of hours outside air ventilation is in use.

160 = Days that air-conditioning system is used per year.

160 x 12 Hours/Day = 1,920 Hours

E = Efficiency of fuel utilization = 75%

C = Heating value of one unit of fuel = 140,000 BTU/GALLON of fuel oil.

$$X = \frac{\text{Heat Loss} \times (\text{Inside Design Temp.} - \text{Average Outside Temp}^*)}{(\text{Inside Design Temp.} - \text{Outdoor Design Temp.})}$$

* From Table 2 Page 649, 1968 ASHRAE GUIDE

$$= \frac{75,600 \times (70-43)}{(70-0)} = 29,000 \text{ BTU/HR.}$$

$$F = \frac{XN}{C \times E} = \frac{29,000 \times 1920}{140,000 \times 0.75} = 530 \text{ Gallons of oil/year}$$

Equation 4. On Page 653, 1968 ASHRAE GUIDE

$F = U \times N_b \times D \times C_f$

F = Fuel consumption for the estimate season.

U = Quantity of fuel used/degree day

From Table 4, Page 654

N_b = Calculated hourly heat loss/1000 BTU/HR.

$$= \frac{29,000}{1,000} = 29$$

D = Number of degree days for the estimated period.

From Page 649 for St. Louis
In 1968 ASHRAE GUIDE.

October	251
November	627
December	936
January	1026
Febrauery	848
March	704
April	312
	4,704 Degree Days

C = 0.0049 Unit fuel consumption constant based on 0°F outdoor design temperature and 70°F indoor design temperature.

C_t = 0.875

F = 0.0049 x 29 BTU/HR. x 4704 x 0.875 = 585 Therms

Equation, On Page 655 of 1968 ASHRAE GUIDE

$$K.W.H. = \frac{(H.L) \times (D.D) \times C}{T.D}$$

H.L = Heat loss calculated in first step = 75,600 BTU/HR.

D.D = Degree Days

C = Constant

= 18.5 as per *N.E.M.A. Report* (Page 655– 1968 ASHRAE GUIDE)

TD = Temperature differential between indoor design temperature and Outdoor Design temperature.

$$K.W.H. = \frac{75,600 \times 4,704 \times 18.5}{3,415 \times 70}$$

= 2,750 K.W.H.

During Cooling Season

Sensible Heat Extraction

= C.F.M. x 1.08 x T.D.

= 1,000 x 1.08 x15

= 16,200 BTU/HR.

T.D. = (Outdoor design temperature – Indoor design temperature)

Latent Heat Gain

= C.F.M. X Humidity difference in Grains/Lb. of air x 0.7 Constant

= 1,000 x 38.5 x 0.7

= 26,950 BTU/HR.

During Cooling Season

95°F D.B.T.)
) – Outside Condition
78°F W.B.T.)

78°F D.B.T.)
) – Inside Design Condition
50% R.H.

Assuming that a system operates 12 hours per day, 5 days per week and 26 weeks per year, average differential energy content (total enthalpy is 10.2 BTU/LB.)

$$= \frac{26 \text{ Weeks} \times 5 \text{ Days} \times 12 \text{ hrs.} \times 1{,}000 \text{ CFM} \times 10.2 \text{ BTU/LB.} \times 4.5 \text{ Constant}}{12{,}000}$$

= 5,970 Tons per year

1 Ton of cooling requires 1/H.P. of electricity

1 H.P. = 0.746 K.W.

Electricity Saved in Cooling

= 5,970 x 0.746

= 4,475 K.W./Year

Factors Used in Above Formulae Are For St. Louis, Missouri.

Mr. SCOTT. First, the bill provides incentives and assistance to provide energy conservation in buildings used by a significant amount of the public across the country.

Second, the bill is timely. There is an immediate and urgent need for an extensive energy conservation program nationally. The severe 1976-77 winter has made much of the population aware of that fact.

Three, the bill will bring into operation some of the extensive talent, know-how, and technology for energy conservation presently available in the business, industrial, and public sectors.

Four, by demonstration and positive results, the program can have effects reaching into the private sector. The money invested in energy conservation now can pay significant dividends in the future by helping to assure future supplies of energy.

Six, productive worthwhile work and jobs will be created now, with a potential for increasing such work in the future as energy conservation moves to other school buildings and construction in the private sector.

The program can help verify the most promising energy conservation alternatives for buildings in various regions of the nation.

Finally, a demonstration of what one type of incentive can accomplish may encourage the Congress to provide other types such as tax incentives to encourage intensive energy conservation by homeowners, business, and industry. You will note that MCAA has suggested a plan based on energy savings. This plan is attached to the testimony.

I would like to explain the graph, enclosure 1, with the written testimony. The wording of the bill provides latitude in choice of alternatives for energy conservation measures in each building. This is an advantage as various alternatives and combinations are available for application to each building. The measures for conservation in existing structures generally fall into four major categories.

First, changes to make the building operate, procedures more efficient.

Second, improvements in temperature control systems.

Third, increasing the efficiency of the mechanical equipment.

Fourth, making the building structure more energy-efficient. This is referred to as envelope on the attachment.

For most buildings applying any one of the above, if properly selected, it will make a significant contribution to reducing fuel consumption. A combination of two or more, again carefully selected, can promote additional savings. Cost of the work and its effectivenesss will vary so widely that the alternatiyes can be determined only on a case-by-case basis. Such variables as the age of the building, occupancy patterns, climatic region and architectural style will have an effect. As a general rule, however, the costs and economic feasibility of the alternatives will follow the pattern of the schematic graph.

Case studies reflecting costs and potential savings in school buildings have been developed by the American Association of School Administrators in conjunction with a demonstration project with 10 schools. I assume this data has been made available to your committee by AASA.

The study shows that to obtain the maximum in conservation on a cost-effective basis, each building must be analyzed and a multifaceted program of improvements to operating procedures, building exterior or envelope, controls and mechanical equipment must be used.

I would like to make one informal comment, and that is that we feel that this bill has the possibility of perpetuating energy conservation through the savings made by buildings that are modified under the original grants, amd we feel that this is one of the outstanding points of this bill.

MCA appreciates this opportunity for comment, and we will be pleased to provide additional comments and details as may be needed, and of course answer questions when the other gentlemen testify.

Thank you.

Mr. CROSS. Thank you.

Mr. Phipps, would you like to proceed?

STATEMENT OF H. HARRY PHIPPS

Mr. PHIPPS. Mr. Chairman, my name is H. Harry Phipps. I am employed as energy manager for Chloride America with headquarters in Tampa, Florida. Chloride is a manufacturer of electric storage batteries and we have facilities in 16 States, Puerto Rico, Mexico, and Canada.

It is my responsibility as energy manager to seek effective means of conserving energy in these facilities. I am appearing before your subcommittee today on behalf of the National Society of Professional Engineers. Our society is nonprofit and was founded in 1934 as an organization dedicated to advancing the social and professional environment of the professional engineer and to serve the public welfare by offering engineering viewpoints and services in matters of public policy in which an engineering background and expertise is pertinent.

The society consists of nearly 72,000 individual members engaged in virtually every aspect of engineering practice and has affiliate State societies in each State and more than 500 local chapters.

I am a registered engineer in Florida and Georgia, and a fellow in the Florida Engineering Society. In addition to membership in the National Scoiety of Professional Engineers, I am a member of the Energy Committees of the American Institute of Plant Engineers and the American Institute of Plant Engineers and the American Society of Heating, Refrigerating and Air-Conditioning Engineers. Prior to joining Chloride America last year, I had my own consultng firm, Energy Systems Consultants, which I started in 1963. For 13 years we specialized exclusively in the evaluation of energy systems and sources. Energy Systems Consultants was the first consulting engineering firm in the nation to specialize exclusively in the field of energy conservation.

My first project was the evaluation of seven rather complex energy systems eligible for consideration in a new senior high school built in Niceville, Florida. Since that time a significant portion of the work performed by Energy Systems Consultants has

involved public school facilities. I have had a number of articles published on energy conservation in schools and have made several speeches on the subject, including an address to the Association of School Business Officials. Prior to opening my consulting office, I was involved n the development of the concept of air-conditioning for public schools.

The concept of providing Federal financial assistance to local educational agencies to assist them in their energy conservation efforts is one that is sorely needed. Almost as important as providing the financiaL assistance, the proposed legislation provides a convincing argument to local agencies that energy conservation efforts are truly justified. You are to be commended in your farsightedness in developing meaningful legislation to support the nation's energy conservation efforts.

The need for this type of assistance can be demonstrated, I believe, from my own experience with public school projects. In 1969 and 1970 we were retained by a number of local school systems in Florida to evaluate the relative merits of a number of different types of air-conditioning equipment and systems being installed in existing school facilities. Recognizing that much of the basic data in these studies were common to all—in this case, climatological data and utility rates—I approached the State Department of Education in Tallahassee with a suggestion that this basic data be developed for the entire State and comparative evaluations developed for the basic systems being considered by most school systems. The suggestion was accepted and the project completed, providing much-needed assistance to school systems throughout the state.

Unfortunately, state funds would have provided still more benefits to local educational agencies. The legislation being considered here today would have made this next step possible by providing needed financial assurance and encouragement.

It is also recognized that the same principle utilized in the Florida study was practical for application to all other areas of the nation. With some assistance from the officials of the State Department of Education in Florida, I approached the Department of Education here in Washington with the suggestion that a preliminary study be funded to investigate the feasibility of extending this data for nationwide application. Although the merit of the idea was readily conceded, no funds were available at that time. Again, this legislation would have made that possible. Incidentally, the concept is still sorely needed.

In the same manner we have seen school systems from St. Lucie, Florida, to St. Louis, Missouri, who recognized that they had a problem but were unable to develop the funds (or was it the motivation to develop the funds?) to pursue their desires for energy conservation to the ultimate conclusion. This is indeed unfortunate in that our educational institutions continue to be burdened with increasing costs that they can ill afford and our nation continues to be burdened by unnecessarily high energy usage and the subsequent drain upon our natural resources and our dollars being spent for foreign fuel.

Actually, these unnecessarily high energy costs have a cascading effect and result in a significant impact upon the national economy.

Countermeasures such as you are now considering are mandatory if this trend is to be reversed.

The Florida study serves as an example of the type of projects that can be conducted for the mutual benefit of many local educational agencies and is described in the two-part article appearing in the January and February 1972 issues of the ASHRAE Journal. A number of reprints of this article have been given to your staff for further reference.

Figure 2 in that article is reproduced on the following page and shows how the State was divided into climatic zones so that all schools within one zone could utilize the same basic data for energy-estimating purposes. In much the same manner, similar zones could be established for the entire Nation.

The State of Georgia, the State of Indiana, for example, probably lends itself to the application of data from two climatic zones, and that climatic zone could extend all the way across the Nation.

Table 2 from those articles, also shown on the next page, illustrates the type of cost data that was developed and could be applied to practically every local school system in the State. The utilization of this type of simplified data on a regional basis would contribute greatly to the reducton of the cost of engineering studies by individual school systems. Funding for such projects, however, is not available today.

Many people still do not understand the full benefits to be realized from energy conservation efforts. They look at it as maybe dollars only, but they do not realize the ecological benefits that accrue.

One of the figures from another article that was published in ASHRAE Journal of 1974 gives us some idea of fuel that is used by each of the alternatives that were considered in this particular study, the amount of pollution that would result from the various systems. We see that there is a significant difference in the amount of electricity that is used by different alternatives, the amount of energy that is required, the demands placed upon our power companies and our energy distributing systems, so that there is a great deal of difference, but it must be identified through in-depth engineering study.

With only a very few exceptions, energy conservation efforts result in ecological benefits as well. This was demonstrated in another ASHRAE Journal article published in March of 1974 on the same project just discussed. Figures 1A, 1B, and 1C from that article are reproduced here on page 5B and illustrate not only the differences that exist between the various alternatives considered in that study, but also show the ecological comparisons.

From this you can see that there are significant differences in the amount of energy required by different systems and difference in demands imposed upon our generating facilities. We can see that there is a significant difference in the amount of total fuel consumed and the consequent drain upon the world's natural resources. We see that the more efficient systems not only cost less to own and operate but they also result in less pollution being released in the atmosphere and a smaller amount of waste heat being added to the air and water.

The article goes on to point out that if all of the existing classrooms in the State of Florida were air-conditioned with the most inefficient air-conditioning system, and if the electricity required to operate these units was generated with natural gas, that it would require 10 percent of the total capacity of the pipeline serving peninsula Florida just to meet the demands of existing public schools on a hot afternoon.

When that article was written, there were more than one million classrooms in this country that were candidates for air-conditioning. If all these classrooms were conditioned with these less efficient systems, it might well require the construction of 70 new electric generating plants, each having a capacity equal to the average of all such plants in operation in the United States in 1968.

I was pleased to see that the legislation addressed itself to the problems of management and maintenance. Again we see the true magnitude of the wasteful use of energy. In most cases, however, the local agencies involved were unaware of the magnitude of the impact their decisions would have on their selection of alternatives. The funding proposed in this legislation could correct that situaton.

I was pleased to see that the legislation addressed itself to the problems of management and maintenance. Again, that is one of the things that has been the stepchild of the school systems, failing to recognize the need for quality maintenance. Unfortunately, the importance of the quality of maintenance has not been recognized in our public schools for much too long a time.

As an energy consultant, let me assure you that there are two basic ingredients to the efficient use of energy. One is good design of a facility and the other is proper maintenance and, without the latter, the advantages obtained by the former will soon be lost.

I have also provided the staff with a limited number of copies of a reprint from the Association of School Business Officials Journal in which this subject was discussed. The importance of proper maintenance is even greater today than when the article was written.

As I stated in the opening paragraph of an article written for the January 1973 issue of American School and University, "There is virtually no substantive research being done in the energy requirements on new and remodeled educational facilities. This widespread lack of concern for energy conservation is setting the stage for future economic and ecological havoc.

I sincerely believe that legislation proposed in H.R. 5996 will go a long way in correcting this situation.

With respect to the proposed legislation under consideration, I would like to offer several comments which the committee may wish to consider in its deliberations. All in all, I find the draft dated April 4, 1977, to be clear, concise and quite adequately addressing the problem.

Section 1004, lines 11 and 12. I suggest your consideration of including a reference to engineering services, feasibility studies, or something to that effect at that point. While it is true that these services are covered quite adequately in a later section, it occurs to me that reference at this point would be appropriate also.

I would further suggest the addition of a qualifying statement to the end of the sentence on line 12 as further assurance that funds

be spent in the proper manner. This could be ccomplished by simply adding to the present end of the sentence the statement "as may be recommended by properly qualified professionals."

Section 1006 (d)(1). This section, as I read it, establishes, as one of the criteria for a demonstration grant, assurance that the "project will be economically feasible." While this is of course desirable, a demonstration project may not in every instance prove to be economically feasible despite projections prior to its institution. I would suggest, therefore, words to the effect that this section be revised to include the words "to the degree possible"following "assure". You cannot always tell.

Section 1006 (d)(2). It appears that the present phrasing of this item leaves the prerogative of establishing the rate of return to the individual local agencies. It appears to me that this could only result in such widely varying opinions as to totally discourage or prohibit reasonable energy conservation projects in some cases and to permit the approval of others where feasibility may be questionable, just depending on someone's local viewpoint and attitude towards things.

I suggest that guidelines be established to insure each potential applicant has an equal opportunity to participate in the grant program. Also, given the nature of demonstration grants, I would suggest that, rather than ask for a guarantee of the rate of return in the application, that the legislation be revised to insert the word "probable" between the words "the and rate" in line 10, page 7.

Section 1006 (d)(3). Assuming that I followed the text properly, this requires that a statement concerning feasibility be included in the initial application for a project. I would like to point out that I can conceive of many projects that would qualify for funding where it would be impossible to determine whether the results of the project could be used by other communities until the project was completed. I am not sure just what the committee's intent was in this case, but I suggest your consideration to incorporate the appropriate changes.

The foregoing item, however, does bring to mind the fact that considerable coordination will be required to prevent a duplication of effort in the various projects that will be proposed. This may or may not be an item that should be included in the legislation itself, but some provision should be made to prevent duplication of effort as much as possible.

There is one other area of major concern to me and to the society which I represent, and this has to do with the qualification of those firms that will be offering the type of services that will be involved in fulfilling the objectives of this legislation. The growing interest and mushrooming activity in the fields of energy conservation has brought forth the usual number of opportunities and Johnie-come-latelys whose major qualification is the desire to capitalize on the availability of significant sums being spent for energy conservation. Even in more normal times, the school systems of America have been victimized by high-powered sales promotion schemes of those with more "con than conscience."

I do not know how far you can go in specifying the qualifications of those who would involve themselves in these activities, but I

would certainly encourage you to do whatever is possible in this regard. Just because a company is a corporate giant in America and eminently successful in its own field does not automatically make them experts in the field of energy conservation. Each application for work on these projects should be requird to demonstrate conclusively success of prior projects and accomplishments in this field. If you can in this manner provide additional protection to those local educational agencies that would benefit from this legislation, it would indeed be highly desirable.

Elementary and secondary schools are unique buildings and need to be treated as such in consideration of energy conservation measures. Items that must be fed into the analysis of a single building are size, amount of massive open space areas—cafeterias, gymnasiums—climatic conditions of the area in which the building is located, hours of use per day, regular 8:00 a.m. to 3:30 P.M. class course only or perhaps the addition of night classes in a limited number of rooms, or perhaps double sessions, and months of use, 9 or 12.

There are others, but this listing I believe is sufficient to support the need for legislation as is proposed here. It is also sufficient, in my view, to support the contention that those individuals and firms called upon to provide the services called for in the legislation must be qualified firms with knowledge and experience in the field of energy conservation in the building environment.

Mr. Chairman, I appreciate the opportunity to appear before this committee and will be glad to respond to any questions you or other members of the committee may have.

[The documents referred to follow:]

********** Insert O **********

2029 K STREET, N.W., WASHINGTON, D.C., 20006

TESTIMONY

of the

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

before the

SUBCOMMITTEE ON ELEMENTARY, SECONDARY AND VOCATIONAL EDUCATION

COMMITTEE ON EDUCATION AND LABOR

on H.R.5996

May 3, 1977

Mr. Chairman, my name is H. Harry Phipps. I am employed as Energy Manager for Chloride America with headquarters in Tampa, Florida. Chloride is a manufacturer of electric storage batteries and we have facilities in 16 states, Puerto Rico, Mexico and Canada. It is my responsibility as Energy Manager to seek effective means of conserving energy in these facilities. I am appearing before your subcommittee today on behalf of the National Society of Professional Engineers. Our Society is non-profit and was founded in 1934 as an organization dedicated to advancing the social and professional environment of the professional engineer and to serve the public welfare by offering engineering viewpoints and services in matters of public policy in which an engineering background and expertise is pertinent. The Society consists of nearly 72,000 individual members engaged in virtually every aspect of engineering practice and has affiliate state societies in each state and more than 500 local

chapters.

I am a registered engineer in Florida and Georgia, and a Fellow in the Florida Engineering Society. In addition to membership in the National Society of Professional Engineers, I am a member of the Energy Committees of the American Institute of Plant Engineers and the American Society of Heating, Refrigerating and Air-Conditioning Engineers. Prior to joining Chloride America last year, I had my own consulting firm, Energy Systems Consultants, which I started in 1963. For 13 years we specialized exclusively in the evaluation of energy systems and sources. Energy Systems Consultants was the first consulting engineering firm in the nation to specialize exclusively in the field of energy conservation. My first project was the evaluation of seven rather complex energy systems eligible for consideration in a new senior high school built in Niceville, Florida. Since that time a significant portion of the work performed by Energy Systems Consultants has involved public school facilities. I have had a number of articles published on energy conservation in schools and have made several speeches on the subject, including an address to the Association of School Business Officials. Prior to opening my consulting office I was involved in the development of the concept of air conditioning for public schools.

The concept of providing Federal financial assistance to local educational agencies to assist them in their energy conservation efforts is one that is sorely needed. Almost as important as providing the financial assistance, the

proposed legislation provides a convincing argument to local agencies that energy conservation efforts are truly justified. You are to be commended in your farsightedness in developing meaningful legislation to support the nation's energy conservation efforts.

The need for this type of assistance can be demonstrated, I believe, from my own experience with public school projects. In 1969 and 1970 we were retained by a number of local school systems in Florida to evaluate the relative merits of a number of different types of air conditioning equipment and systems being installed in existing school facilities. Recognizing that much of the basic data in these studies were common to all (in this case, climatological data and utility rates) I approached the State Department of Education in Tallahassee with a suggestion that this basic data be developed for the entire state and comparative evaluations developed for the basic systems being considered by most school systems. The suggestion was accepted and the project completed, providing much needed assistance to school systems throughout the state.

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approached the Department of Education here in Washington with the suggestion that a preliminary study be funded to investigate the feasibility of extending this data for nationwide application. Although the merit of the idea was readily conceded, no funds were available at that time. Again, this legislation would have made that possible. Incidentally, the concept is still sorely needed.

In the same manner we have seen school systems from St. Lucie, Florida to St. Louis, Missouri who recognize that they had a problem but were unable to develop the funds (or was it the motivation to develop the funds?) to pursue their desires for energy conservation to an ultimate conclusion. This is indeed unfortunate in that our educational institutions continue to be burdened with increasing costs that they can ill afford and our nation continues to be burdened by unnecessarily high energy usage and the subsequent drain upon our natural resources and our dollars being spent for foreign fuel. Actually, these unnecessarily high energy costs have a cascading effect and result in a significant impact upon the national economy. Counter measures such as you are now considering are mandatory if this trend is to be reversed.

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Many people still do not understand the full benefits to be realized from energy conservation efforts. With only a very few exceptions, energy conservation efforts result in ecological benefits as well. This was demonstrated in another ASHRAE Journal article published in March of 1974 on the same project just discussed. Figures 1A, 1B and 1c from that article are reproduced here on (Page 5B) and illustrate not only the differences that exist between the various alternatives considered in that study, but also show the ecological comparisons.

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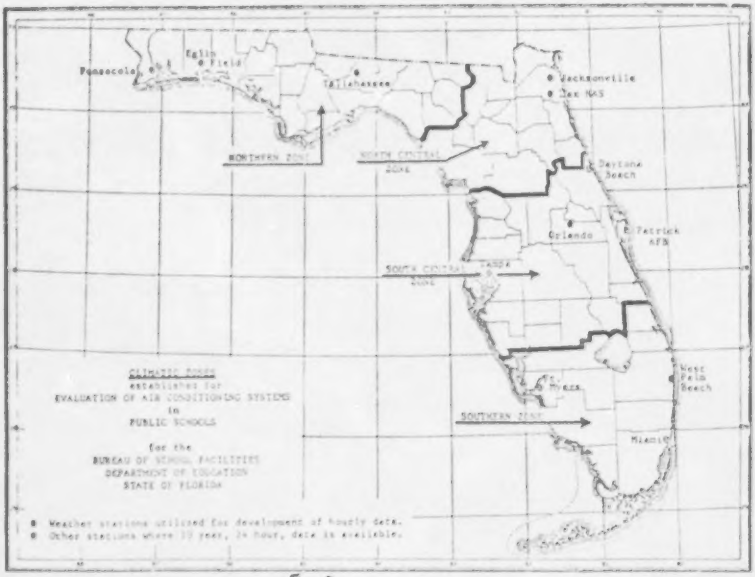

Fig 2

Table II. Summary of Costs—South Central Climatic Zone

Data Applies to All Areas

	Initial cost	Annual replacement cost	Annual maintenance cost	Annual utility cost	Total annual cost
Elementary School					
DXRT*	$ 86,660	$ 7,110	$ 4,777	$2,192	$ 4,079
CWPAT*	119,600	5,744	4,264	2,187	12,215
CCWCT*	126,200	5,348	2,710	2,224	10,282
CWSD*	135,300	5,773	3,327	1,496	10,595
Junior High School					
DXRT	$156,720	$13,170	$8,592	$4,063	$25,825
CWPR	207,600	9,810	6,126	4,165	20,203
CCWC	192,000	8,040	4,036	3,466	15,544
CWSD	207,000	8,730	4,627	2,651	16,008
Senior High School					
DXRT	$195,360	$16,545	$10,876	$5,176	$32,593
CWPR	256,700	12,260	7,617	5,375	25,232
CCWC	224,360	9,396	4,872	4,109	18,475
CWSD	259,900	10,906	6,058	3,077	20,041

* See footnotes, Table I

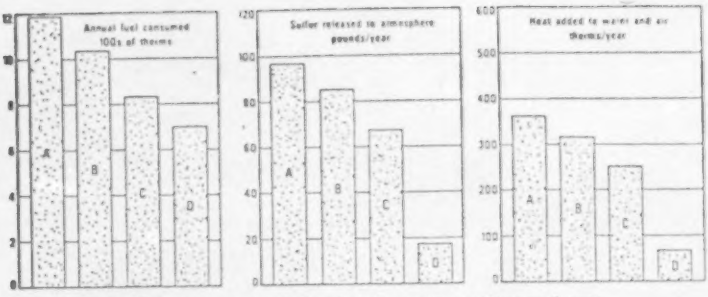

Fig. 1B- Comparative ecological effects of school air conditioning systems per classroom.

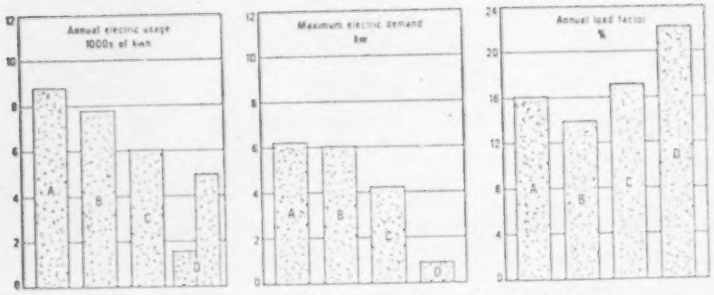

Fig.1A - Comparative electric data of school air conditioning systems per classroom.

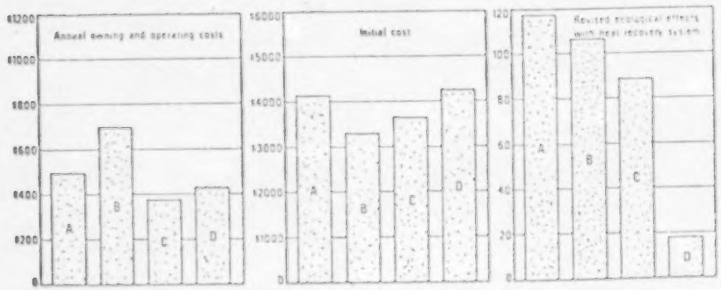

Fig. 1C - Cost comparisons of various school air conditioning systems per classroom.

natural resources. We see that the more efficient systems not only cost less to own and operate but they also result in less pollution being released in the atmosphere and a smaller amount of waste heat being added to the air and water.

The article goes on to point out that if all of the existing classrooms in the State of Florida were air conditioned with the most inefficient air conditioning system and if the electricity required to operate these units was generated with natural gas, that it would require 10% of the total capacity of the pipeline serving peninsula Florida just to meet the demands of existing public schools on a hot afternoon.

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would qualify for funding where it would be impossible to determine whether the results of the project could be used by other communities until the project was completed. I'm not sure just what the committee's intent was in this case, but I suggest your consideration to incorporate the appropriate changes.

The foregoing item, however, does bring to mind the fact that considerable coordination will be required to prevent a duplication of effort in the various projects that will be proposed. This may or may not be an item that should be included in the legislation itself, but some provision should be made to prevent duplication of effort as much as possible.

There is one other area of major concern to me and this has to do with the qualification of those firms that will be offering the type of services that will be involved in fulfilling the objectives of this legislation. The growing interest and mushrooming activity in the fields of energy conservation has brought forth the usual number of opportunists and "Johnnie-come-latelys" whose major qualification is the desire to capitalize on the availability of significant sums being spent for energy conservation. Even in more normal times, the school systems of America have been victimized by high-powered sales promotion schemes of those with more "con than conscience." I don't know how far you can go in specifying the qualifications of those who would involve themseleves in these activities, but I would certainly encourage you to do whatever is possible in this regard. Just because a company is a corporate giant in America and eminently successful in its own field does not automatically make them experts in the field of energy conservation. Each applicant for

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There are others but this listing, I believe, is sufficient to support the need for legislation as is proposed here. It is also sufficient, in my view, to support the contention that those individuals and firms called upon to provide the services called for in the legislation must be qualified firms with knowledge and experience in the field of energy conservation in the built environment.

Mr. Chairman, I appreciate the opportunity to appear before this committee and will be glad to respond to any questions you or other members of the committee may have.

Mr. CROSS. Thank you. Before we get to questions, the witness will be heard from, Mr. Hychka.

[Statement of Steven C. Hychka follows:]

TESTIMONY

presented to

HOUSE SUBCOMMITTEE ON ELEMENTARY, SECONDARY, AND VOCATIONAL EDUCATION

May 5, 1977

by

Steven C. Hychka

Director of the
American Council on Education/
Association of Physical Plant Administrators/
National Association of College and University Business Officers/

ENERGY TASK FORCE

We appreciate this opportunity to discuss the energy needs and problems of the nation's colleges and universities. We are here to make the case that H.R. 5996 should be extended to include postsecondary institutions as well as elementary and secondary schools.

The impact of the nation's energy problems is in no way limited to any one sector of the education community; it is a heavy burden on schools and colleges throughout the country.

The extent of the burden on postsecondary institutions is documented by a special Higher Education Panel report of a recent survey jointly sponsored by the U.S. Office of Education and the Energy Task Force, which is a group organized by the National Association of College and University Business Officers, the Association of Physical Plant Administrators, and the American Council on

one dupont circle suite 510 washington, d. c. 20036

Education. The report has not yet been published, but I would like to summarize some of its highlights:

Nationally, total energy costs at colleges and universities rose from $555 million to $944 million between academic year 1972-73 (FY73) and academic year 1974-75 (FY75) - an increase of 70 percent. This cost increase took place at the same time that increasing conservation efforts by the institutions resulted in a 6 percent decrease in actual energy consumption.

Increased energy costs represented a major burden to postsecondary institutions in all parts of the country, falling most heavily on the East (where energy costs rose 94 percent), and the South (84 percent). The cost increase was 48 percent in the Midwest and 40 percent in the West.

Further findings of the survey are included in the attached summary.

We estimate that a systematic effort to improve the energy efficiency of postsecondary facilities would cost an estimated $4 billion. However, such an effort has the potential of annual energy savings of between $400 and $500 million - the equivalent of the entire annual energy consumption of the aluminum industry.

In view of the large energy costs and the potential for substantial energy savings in postsecondary institutions, we strongly urge that they be made eligible for the grants, demonstration projects, and technical assistance which H.R. 5996 would make available.

With broadened coverage to include the entire education community, the kinds of assistance proposed in this legislation should be an essential component of any comprehensive effort to develop a national energy policy.

This statement is presented on behalf of the American Association of Community and Junior Colleges, the American Association of State Colleges and Universities, the American Council on Education, the Association of American Universities, the Association of Jesuit Colleges and Universities, the Association of Physical Plant Administrators, the National Association of College and University Business Officers, the National Association of Independent Colleges and Universities, the National Association of State Universities and Land-Grant Colleges, and the National Catholic Educational Association's College and University Department.

STATEMENT OF STEVEN HYCHKA

Mr. HYCHKA. My name is Steven Hychka. I am the Director of the Energy Task Force which is a cooperative venture of the American Council on Education, the Association of Physical Plant Administrators, and the National Association of College and University Business Officers. Before going on with the rest of my remarks, I would like to endorse the comments of the previous testifiers. As the group at the table who purchases their services, I would say that I agree, from my understanding of the energy problem, with their comments and concerns.

Mr. HYCHKA. I am presenting for your interest and reading at a later time the highlights of a recent survey jointly sponsored by the U.S. Office of Education and the Energy Task Force, which is a group organized by the National Association of College and University Business Officers, the Association of Physical Plant Administrators, and the American Council on Education.

Nationally, total energy costs at colleges and universities rose from $555 million to $944 million between academic year 1972-73 and academic year 1974-75, an increase of 70 percent. This cost increase took place at the same time that increasing conservation efforts by the institutions resulted in a 6 percent decrease in actual energy consumption.

Increased energy costs represented a major burden to postsecondary institutions in all parts of the country, falling most heavily on the East where energy costs rose 94 percent, and the South, 84 percent. The cost increase was 48 percent in the Midwest and 40 percent in the West.

Further findings of the survey are included in the attached summary.

We estimate that a systematic effort to improve the energy efficiency of postsecondary facilities would cost an estimated $4 billion. However, such an effort has the potential of annual energy savings of between $400 and $500 million, the equivalent of the entire annual energy consumption of the aluminum industry.

In view of the large energy costs and the potential for substantial energy savings in postsecondary institutions, we strongly urge that they be made eligible for the grants, demonstration projects, and technical assistance which H.R. 5996 would make available.

With broadened coverage to include the entire education community, the kinds of assistance proposed in this legislation should be an essential component of any comprehensive effort to develop a national energy policy.

This statement is presented on behalf of the American Association of Community and Junior Colleges, the American Association of State Colleges and Universities, the American Council on Education, the Association of American Universities, the Association of Jesuit Colleges and Universities, the Association of Physical Plant Administrators, the National Association of College and University Business Offices, the National Association of State Universities and Land-Grant Colleges,and the National Catholic Educational Association's College and University Department.

[The above referred to summary follows:]

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IMPACT OF ENERGY COST ESCALATION AND ENERGY CONSERVATION PROGRAMS ON COLLEGES AND UNIVERSITIES

Frank J. Atelsek
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Higher Education Panel Reports
Number 31 February 1977

American Council on Education
Washington, D.C. 20036

A survey sponsored jointly by the U.S. Office of Education and the Energy Task Force, a group appointed by the National Association of College and University Business Officers, the Association of Physical Plant Administrators, and the American Council on Education.

Highlights

National Estimates

- Between the 1972 - 73 academic year (which is FY 1973) and the 1974-75 academic year (FY 1975), total energy costs at colleges and universities rose from $555 million to $944 million, a 70 percent increase.
- Over the same period, total energy consumption decreased by 6 percent from 4.25 billion therms to 4.01 billion therms. (These figures make no adjustments for changes in student enrollment or in size of physical plant.)
- Overall energy costs averaged 13.1 cents per therm in 1972-73 and 22.5 cents per therm in 1974-75, a 79 percent increase.

Fuel Types

- The greatest increase in per-unit cost during the survey period occurred for oil (163 percent), followed by coal (126 percent). The per-unit cost of natural gas and purchased electricity increased less drastically (64 percent and 57 percent, respectively).
- In both years, natural gas provided 45 percent of total therms consumed; electricity and oil each provided about 20 percent; and coal, slightly more than 10 percent. The relative consumption of both oil and coal decreased slightly over the period.
- Electricity accounted for 55 cents of each energy dollar spent by higher education in 1974-75; oil and natural gas, about 18 cents each; and coal, 6 cents. The proportion spent for both oil and coal increased over the earlier year (1972-73).

Regional Estimates

- Institutions in the East and South experienced the greatest increases

in total energy costs -- 94 percent and 84 percent, respectively. Smaller increases occurred in the Midwest (48 percent) and the West (40 percent).

- Ignoring increased enrollment and plant size, overall declines in energy consumption were highest in the South (7 percent), followed by the West and the Midwest (6 percent each), and the East (3 percent).
- The per-unit cost of energy increased most at institutions in the East (101 percent), from 16 cents to 33 cents per therm. The South averaged a 97 percent increase (from 12 cents to 23 cents); the Midwest, 58 percent (from 12 cents to 20 cents); and the West, 50 percent (from 12 cents to 18 cents).
- In 1974-75, the East paid the highest per-unit cost for all types of fuel except coal.
- Over the two-year period, the per-unit cost of both natural gas and coal rose most sharply in the South (100 percent and 185 percent, respectively).
- Oil was the predominant source of energy in the East (providing nearly 50 percent of the total therms consumed, whereas natural gas was the predominant source in the West (providing about 65 percent of total therms consumed), in the South (over 50 percent), and in the Midwest (just under 50 percent).

Cost Per Student

- Nationally the energy costs per student increased 57 percent between 1972-73 and 1974-75, from $79 to $124.
- The East experienced the greatest per student increase in energy costs: from $103 to $184, a 78 percent rise.
- The smallest increases occurred in the West, where energy costs were

lowest: from $57 per student in 1972-73, to $71 in 1974-75, a 25 percent increase.

Cost Per Square Foot

- The energy cost per square foot increased 57 percent from 1972-73 to 1974-75, from 28 cents to 43 cents.
- The largest increase occurred in the East: from 32 cents per square foot in the earlier year, to 58 cents per square foot in the later year, an 81 percent increase.
- Institutions in the West experienced the lowest increase: from 24 cents to 32 cents per square foot, a 30 percent increase.

Therms Per Square Foot

- Nationally, total energy consumption dropped over the period from 2.11 therms per square foot to 1.85 therms, a 12 percent decline. (These figures represent adjustment for changes in the amount of space serviced.)
- Institutions in the East reported a 9 percent reduction in energy consumption per square foot; figures reported by institutions in the other three regions more closely resembled the national figure.

Proportion of Current Fund Expenditures (CFE)

- The median percentage of CFE that went for energy rose from 2.7 percent in 1972-73 to 3.6 percent in 1974-75.
- Institutions in the East spent the largest proportions of CFE for energy (3.2 percent in the earlier year and 4.3 percent in the later year,), and those in the West spent the smallest proportions (2.1 percent in both years).

Primary Fuel Type

- Of the approximately 3,000 colleges and universities in the United

States, 53 percent relied on natural gas, 21 percent on oil, and 3 percent on coal as their primary source of energy.

- Institutions dependent primarily on oil suffered an 82 percent increase in total energy costs (from $132 to $239 million); those dependent primarily on coal, a 79 percent increase (from $51 to $92 million);and those dependent on natural gas, a 46 percent increase (from $267 to $389 million).
- Colleges and universities relying chiefly on oil experienced a 116 percent increase in their per-unit cost of energy, from 15 cents to 33 cents per therm.
- Institutions relying chiefly on either natural gas or coal experienced per-unit cost increases of 62 percent and 86 percent, respectively, bringing their total energy cost up to 19 cents per therm for each type of fuel.
- In 1974-75, oil-dependent institutions spent $194 per student for energy, those relying primarily on coal paid $151 per student, and those relying on natural gas paid $108 per student.

Type of Institution

- The increase in per-unit cost of energy was about the same--80 percent--at each of the three institutional types: doctoral-granting institutions and other comprehensive universities and colleges; other four-year colleges; and two-year colleges.
- In 1974-75, on average, doctoral and comprehensive institutions paid about 22 cents per therm, other four-year colleges averaged about 24 cents per therm, and two-year colleges paid about 30 cents per therm.
- Two-year colleges reduced their total energy consumption by 15 percent; doctoral and comprehensive institutions, by 5 percent; and other four-year colleges, by 3 percent.

- When adjustments are made for space changes during the survey period, the reduction in energy consumed turns out to be greater: 26 percent at two-year institutions, and about 10 percent at the two other categories of institutions.
- On a per-student basis, differences in the amounts of energy used varied widely among the three institutional types. In 1974-75, the energy used per student averaged about 750 therms at doctoral and comprehensive institutions, 570 therms at other four-year institutions, and about 200 therms at the two-year colleges.

Conservation Measures

- Three phases of conservation effort were defined: quick-fix, involving obvious measures that achieve significant energy savings at small cost; refit, involving engineering analysis and moderate amounts of capital investment; and systems convert, involving major changes in systems design, usually requiring substantial capital investment.
- Most (percent) of the 533 institutions responding to the survey have adopted those quick-fix measures which can be easily implemented by the physical plant manager. Few institutions (percent) have adopted those quick-fix practices requiring the cooperation of the institutional community.
- Only two of the nineteen refit measures listed in the survey questionnaire have been completely implementated by one-fifth or more of the responding institutions; over half the respondents believed that the various refit measures listed should be implemented further.
- One in five responding institutions has upgraded its boiler/chiller plants by converting to alternate fuel sources; 17 percent have begun to automate their power plants.

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- In general, doctoral and comprehensive institutions have led other types of institutions in implementing conservation measures.
- Almost half of the responding institutions reported holding interruptible gas contracts; of these, 44 percent experienced some curtailment during 1974-75.

Mr. CROSS. Thank you all for the statements. I think they added a great deal to the testimony.

I would like to address some questions to you and several of these I suspect many of you may want to respond to, but from your various prospectives, could you give the subcommittee some indication of what some of the most cost effective in terms of fuel efficiency, things that schools could do to save energy?

Mr. HYCHKA. The speaker before me I think really put his finger on it. The most easily done activity is good maintenance. We have our buildings, it doesn't cost too much to provide good maintenance, and indeed, the institutions that I represent have saved in the District of Columbia on the magnitude of 40 percent in their energy bills just by doing good maintenance and having a good comprehensive energy plan that costs nothing, closing windows, turning down thermostats, and things of that nature, rescheduling classrooms, but I am sure you could talk some more about the other ones.

Mr. PHIPPS. I think maintenance too long has been looked upon as a janitorial function in schools, and as I have said in an article somewhere, I suspect we have people who are servicing our $5,000 automobiles being paid more than those servicing our half million dollar air-conditioning systems; that is just the way we have approached it in schools, not recognizing the importance and complexity of the present day mechanical system in a public school.

I would have to agree that those things that are most important are an awareness, to develop an awareness in our school people about energy and the need to conserve it; to provide the training to maintenance personnel to do those things that are obvious to those who are in the field of energy conservation.

Great strides and great savings can be made just developing the awareness and the desire.

Mr. CROSS. Would either Mr. Scott or Mr. McKittrick like to respond?

Mr. MCKITTRICK. In our particular geographic area where we are concerned with keeping our children cool enough to learn as opposed to keeping them warm enough, one of our major users of energy is the air-conditioning system. But one of the major contributors of heat load to the air-conditioning system is the lighting, and we have found that this component of the air-conditioning load can very easily be reduced substantially, and there have been a number of studies done very recently that indicate that under various lighting levels ranging from 3.1 foot candles all the way up to 53 foot candles, subjects reading under those conditions showed absolutely no difference in reading rates once they have had time to adjust to those lighting levels. So what this suggests is that the human eye can adjust very readily to differing light conditions.

We have been able to, in some of our recent projects, reduce the lighting consumption from 2 watts per square foot to about 1 watt per square foot, and we have been able to provide an equally good lighting condition within that classroom space.

This is an area, particularly in parts of the country that are heavily reliant on air-conditioning, to look very closely at this subject, and we have done a survey of State standards related to heating, ventilating and air-conditioning within our energy subcommittee.

Another variable with a broad range of variation across the country in the various States is the load imposed on a building by bringing in outside air for ventilation purposes during either the heating or the cooling season. We used to call it fresh air but we have changed that term now to outside air because in very few circumstances is it really fresh.

We do know by reducing that amount of outside air we can reduce substantially the heating or the air-conditioning load on the building. We suggest and recommend that there be some consideration given to some latitude on the part of the school districts being cosidered for these grants, some latitude beyond code mandated lighting and outside air requirements, because if those lighting levels and those outside air requirements are mandated by local codes, then you have got problems in really doing some meaningful energy use reduction.

Mr. CROSS. That comment would seem to argue for a comprehensive approach to this issue rather than one that just involves the schools.

For example, the Administration bill talks about a State plan that involves the Governor looking at all aspects including the topic you mention.

Mr. MCKITTRICK. That is correct.

Mr. CROSS. Could I ask each of you whether you feel that individual institutions should apply or would a better approach be to have a State plan that would deal with the issue in a comprehensive statewide approach?

Mr. HYCHKA. Yes. I am ready to respond to that because we have responded to the ASHRAE 90 and to the MCEC study on new buildings and also the proposed drafts on existing buildings.

I think that concern will be addressed and is now being addressed by the commissioners of the States under the auspices of the Governors. Whether the States do adopt such standards or not is just really a matter of time. Right now they are being given a carrot to take it. They will eventually get it through HUD anyway. I think that is going to happen.

I would not make my decision, if I were you, based on the existence or non-existence of those standards. I believe they are going to happen.

I would like to pursue the other question you asked about; where are the heavy hurters in terms of energy conservation? Our estimate is—and please correct me if I am wrong—that about 15 percent of the potential savings is in the envelope and the balance of about 85 percent of the potential saving is in the mechanical systems. That, of course, is beyond doing, assuming that the plant is inadequate in maintenance, and also we have done the best we can on scheduling.

Mr. CROSS. What are those figures again?

Mr. HYCHKA. Fifteen percent on the building envelope and 85 percent in the mechanical system.

Mr. SCOTT. I would like to reply to that in that within our testimony we did indicate that we feel that the only way to evaluate the problem is on a case by case basis. We feel that each building, each climate, each architectural style will come up with a slightly different answer.

While I would agree that maintenance, operation and probably the addition of some controls, so the operation can be controlled by an aware operating staff, might be the most cost effective, they are not necessarily the optimization of energy savings.

For instance, in the demonstration schools there is an example of an update and improvement in controls which had a 1.5 year payback for the expenditure of $1,000, so thus a $600 savings in energy per month.

The case right above that shows a $25,700 expenditure for a number of items with a 3-year payback. The return in energy savings must be somewhere around $8,000 per year by a much more complex and comprehensive change in the building, pending a considerably larger amount of money, and also saving a considerably larger amount of energy. So each instance must be taken on its own, and although no small savings with rapid paybacks may be possible from various means, we feel that the building in question should be analyzed and all possible steps analyzed for their potential energy saving and cost effectiveness.

Mr. CROSS. Are you reading from a chart, Mr. Scott, that we might have for the hearing record?

Mr. SCOTT. Yes. This is the result of the AASA study on the 10 demonstration schools.

Mr. CROSS. I think we have that in the record from this morning. Thank you.

The bill authorizes, as several of you have noted, technical assistance and its authorization I believe of $120 million a year for four years. Some have raised the question of whether there are enough trained, qualified people out there and two or three of you mentioned or alluded to that issue in one way or another.

I heard on one of the Sunday talk shows the new Chairman of the Federal Trade Commission talking about the problems of potential fly-by-night operations beginning in this area again, and I don't recall which, perhaps Mr. Phipps mentioned the need for qualification specification.

I would appreciate anything else you might like to offer along those lines, any specific suggestions you could offer the committee in terms of things that might be written into the legislation and how to handle that question of qualification, because I think it's an awfully important one and one where you can see the money wasted very quickly.

Would any of you like to respond to that?

Mr. PHIPPS. I share your concern; the engineering society shares your concern; is there enough? But, I believe that the engineering community can respond fast enough to meet this demand. But I would not in that manner encourage you to lower your standards or what I suggested to you one iota.

Mr. CROSS. You mentioned, I believe, people that have some prior experience; is that correct?

Mr. PHIPPS. Yes, sir.

Mr. CROSS. I would like to ask Mr. McKittrick and Mr. Scott whether you believe that would be a fair qualification?

Mr. SCOTT. I think it would be difficult on the basis of showing past installed capacity that had been changed. I think there are a

number of people in the technical society who have done studies which were never acted upon by the owners of the property studied, and for that reason I think it may be difficult to limit it to those who have previously done extensive studies that were actually carried out.

Mr. CROSS. Thank you, Mr. McKittrick.

Mr. MCKITTRICK. I tend to agree with that.

In our statement we have indicated that we suggest that some minimum level of qualifications be required of those providing technical assistance, as FEA has established for persons conducting energy audits, and I believe in their recommendations or their standards. They require either a licensed architect, a licensed engineer, or a person who has a degree with at least four years of experience, something on that order.

We do feel that there needs to be some qualifications established.

Mr. CROSS. Mr. Hychka.

Mr. HYCHKA. I would hope if you do write in such a clause to the bill and it becomes law that it not require a certified statement, because that certified statement would probably cost as much as some of these demonstration and retrofit programs would cost themselves.

We do know some modifications will substantially reduce energy consumption. We know that for a fact. It's general knowledge within the expertise that we alrady have in our employ. I don't think it would be necessary to have such a certification. I do feel, however, that we should make sure that the rascals are not allowed into the field.

Mr. CROSS. Thank you.

Two more questions: You gentlemen had a chance to see the Administration bill on energy conservation which lists very specifically some measures to be funded. If you have, please feel free to comment now. If not, maybe you would like to comment after you have seen it on whether you think that list of things to be included would be a fair list and one which might be included in legislation, if reported from this committee.

Mr. PHIPPS. I have had occasion to see the proposed bill. I believe, briefly, I am concerned with the list. It is a simple laundry list and misses the total picture by a long way. It's too specific in some cases and too general in others.

It's a good thing, but it was not prepared by shall I say ASHRAE. It's not prepared by a group of engineers who are knowledgeable in the field. It's good if the list were prefaced by the words, "As an example the following:" If you were to cut it down a bit, make it just to indicate these kinds of things, I would feel much more comfortable with it.

Mr. CROSS. I think the Chairman has something.

Chairman PERKINS. Mr. Phipps, in your statement you mention you had worked in making schools in Florida more efficient users of air-conditioning. I am glad you mention that because too many people believe that problems of energy efficiency are limited in the cooler Northern regions of the country, and I would like you to elaborate for the record what amount of energy is being lost in Florida due to energy inefficiencies.

Now, let me put a question to you all: I am wondering whether you believe that a separate bill limited to education would help local school districts and colleges. Do you favor adding colleges to the types of constitutions eligible for grants, or should Congress go along with the Administration's approach of grouping public and private schools, colleges and hospitals together?

Go ahead.

Mr. CROSS. Mr. Scott, would you care to respond?

Chairman PERKINS. Yes, just take it all the way across. You start first, Mr. Scott.

Mr. SCOTT. I would be very much in favor of seeing a separate bill rather than trying to put them all together. I would also echo Mr. Phipps' comments about laundry list type of legislation.

Mr. CROSS. Let's come back to that if we could, and first deal with this one issue.

You favor separate legislation?

Mr. SCOTT. Yes, I would favor the separate bill approach.

Mr. CROSS. Mr. Phipps?

Mr. PHIPPS. In general, I guess I would rationalize my answer in the affirmative of favoring a separate bill, only in my conviction that we must have a specific effort directed to all segments of energy usage in schools. I would say keep it simple by trying to keep it all under one umbrella, but I think I would have to go along with saying we need a specialized effort directed to schools.

Schools, I think as I indicated in my prepared statement, are a little different breed of things, and they do need encouragement, incentive and financial assistance so it can best be given by having a separate effort.

Mr. CROSS. Mr. McKittrick?

Mr. MCKITTRICK. In my previous statement I stated: "The special funding program this bill would set up could provide significant help to the country's schools in meeting the energy cost problems they are confronting. While schools are eligible for Federal assistance for energy conservation under other programs, none of those programs provides direct capital funding and schools must compete against many other applicants. A funding program specifically targeted at schools, with their particular problems in financing and decentralized operations, can therefore be justified."

We do believe that this would be important, that there be a separate program for schools.

Mr. CROSS. Mr. Hychka?

Mr. HYCHKA. I have two views on this: The first is that as we now read the President's bill, it's just inadequate; $300 million for the nonprofit sector is just totally inadequate. For our area alone we need $ 4 billion.

The other people that the bill is directed to spend twice as much money per year as we do, I would assume. Therefore, that their energy bills are on the order of magnitude of twice what we are talking about. We are now beginning to talk, and I have no estimate as to what hospitals have in terms of energy consumption and costs. I have no idea of what the United Givers spend in energy per year, but I do know that $300 million per year for 3 years, which is the President's plan, is inadequate for our needs.

The second concern I have is what you were alluding to before, and I would like to list and be limited to that list. Maybe I am looking at higher education with pink eye shades, but we feel that we are the fountain of new knowledge, in many cases even our physical plant people, even our physical plant people have visions that are already up and running and have not yet been assimilated by the industry or the Nation, including great saving devices in flourescent tubes.

Purdue University, my alma mater, has a considerable saving device that is not available to the market yet that is going to be put up in their entire steam line system. I would hate to be limited. My point is, I think we are different. I think we should not be lost in a comprehensive plan that has always lumped us in with industry, commercial and residential. We are none of those, but yet we are all of those.

Mr. CROSS. Mr. Phipps, the Chairman had another question for you if you would like to respond to that on the air-conditining.

Mr. PHIPPS. I don't recall the specific question.

Mr. JENNINGS. The Chairman wanted to know, in your study in Florida, whether you had come up with any idea of how much was being wasted in Florida through energy inefficiency in the air-conditioning systems.

Mr. PHIPPS. Yes, I did, but I was scared to tell them in Florida as to how much it was.

Again, there are many places to measure. How do you evaluate what is wasteful and what is the practical turning around point. The objective of the study was not to evaluate how much energy was being lost, but to evaluate the relative merits of different approaches to our energy usage and energy utilization.

We did identify schools, different air-conditioning systems for schools, and we found that some used almost half as much energy as others. These are systems that are being used commonly in Florida. There were four; most of the schools in Florida, existing schools had either installed one of four different type systems. One of those systems used almost twice as much energy as the other, and had almost twice as much demand, electric demand as the other.

I am sure Florida is no exception. All school systems waste energy, simply because in the past they haven't known which was the wasteful system, and this is what this legislation should address itself to.

Secondly, frequently the better system costs more money initially, and this has been a problem.

Mr. JENNINGS. If we could follow up on that, statements were made this morning that the schools in general are wasting 50 percent of the energy which they are consuming. We are trying to find out whether that is peculiar to the Northern regions of the country with the heating system or whether it's also true about Southern regions of the country which need air-conditioning systems in certain months of the year.

Did you come up with any type of estimate about approximately how much more efficient the schools could be in Florida after your study than they are now with the use of air-conditioning?

Mr. PHIPPS. Let me first phrase my response in one context that you have just stated, that I would not argue with the figure of 50 percent of any of the schools that we have seen. I could say from St. Lucy to St. Louis. That is a good figure.

It would be my guess we were wasting half of the energy being used, and by judicial application of energy conservation measures we could correct that.

Florida is no exception.

Mr. HYCHKA. That is not to say we are alone, that is the national figure, that is the world figure, half of the BTU content contained in a piece of coal or a cubic foot of gas is wasted. It's just an engineering fact. The only thing you can do is cut it down. With a cogeneration plant you might go as high as 77 percent, but 50 percent is a world figure.

Mr. JENNINGS. That detracts from the point, because I have been in the Soviet Union and some other countries, and you will be sitting in a building from 6 o'clock to 7 o'clock at night, and they won't turn on the heat, and you have to have sweaters and it will be very cold. It may be true in general there is a heat loss, but it is more particularly true of this country, there is more of a heat loss because of the patterns of consumption and the manner in which the buildings have been built.

Mr. HYCHKA. Yes. Engineering-wise anything you burn right now, based on our general technology, 50 percent goes up the flue.

However, what we can do is cut down the amount and quantities that we burn.

If you are talking about that percentage, I am not sure if we are 50 percent inefficient. I am just not sure. It's probably a good figure; it might be worse.

Mr. PHIPPS. If 50 percent goes up the flue, that is a most inefficient system. Some systems are dangerous when they get down to that low efficiency.

Seventy to 75 percent; there is little reason why any combustion system should operate at any less efficiency than that. But that is not detracting from the fact that overall I think we are wasting 50 percent.

Mr. JENNINGS. Mr. Phipps, if you are saying 75 percent of the fuel consumed is in the building and 25 percent or so is wasted, what percentage of that 75 percent then could be used more efficiently and what percentage is inefficiently used today?

Mr. PHIPPS. Let me get back to specifics. My response was to his comment that 50 percent goes up the flue. That is where I differ with him. It doesn't go up the flue. It may be wasted but it doesn't go up the flue. Seventy-five percent of the heat should be recovered from a typical good combustion system.

Once it has been converted, the fuel has been converted at the efficienty level to heat, now there is a lot of places it can be wasted before it gets to warming the space, and there we may well have a 50 percent overall utilization factor.

Mr. HYCHKA. That is what I mean.

Mr. PHIPPS. My argument is just with is going up the flue.

Mr. JENNINGS. Before Chris asks his last question, I just want to explain to you why you might feel like somebody who has been told

they are accepted at Harvard and then they wind up being taught by graduate students instead of professors. In the situation today, the House is working on all sorts of legislation at the last minute, because the new Congressional Budget Act requires Congress to report from committee all bills which are to affect the next school year or the next fiscal year by May 15, and therefore we have two subcommittees marking up legislation and the House is working at a rather frantic pace to get all of these bills processed in time.

That is why you don't have Members here today, not necessarily because they aren't interested in the issue but rather because their presence is demanded in actually writing bills that have to move immediately, and all of your remarks are being transcribed and they will be printed and they will be very useful to the Members, so I just want to make sure you understand why we are alone up here instead of with our bosses.

Mr. PHIPPS. I would like to make one other comment, addressing a question you posed a while ago or statement you made concerning what can we do to assure that we don't get taken in, so that the money is spent wisely?

I would invite you to consider reference to some manner on the work that is being done by your various engineering, technical societies. It just happens Mr. Scott serves on the same committee, Energy Conservation Committee of ASHRAE.

We didn't know we were both going to address your group here this afternoon, but we are both members of the 100.4 Committee that has just written and completed a draft of a standard for energy conservation in the existing industrial buildings.

There is in the process of being written a 100 series standard for energy conservation in existing public schools. ASHRAE is a very effective organization that addresses itself to energy conservation in all forms in just heating and air-conditioning.

Mr. CROSS. Would you spell out for the record what ASHRAE is?

Mr. PHIPPS. American Society of Heating, Refrigeration and Air-Conditioning Engineerings, headquartered in New York. NSBE endorses the work of ASHRAE. It's a very effective group. In the 100.4 Committee of which Mr. Scott and I are members, we do not address ourselves strictly to heating and air-conditioning, but all of the forms of energy usage you would anticipate finding in an industrial plant, and I am quite confident the committee working on the school standard will do the same thing.

I was also a member of the 90-75 Committee. As you well know, 90-75 is now being referenced in many forms of legislation. I suggest your consideration, depending upon when the legislation is approved, of the ASHRAE standard on energy conservation in public schools. It's identifiable and perhaps you would like to identify that.

I further suggest a closer coordination of efforts between Government agencies and your efforts and engineering societies such as ASHRAE. There is a tremendous amount of talent in that organization, and people who give of their time very freely, and we are well balanced; we are not dominated by any particular interests. I represent industry, but I am not the only field that is represented. There must be a better way to coordinate the things we are trying to do in the engineering societies, and what you are trying to accomplish also.

I think it would make the task much easier.

Mr. CROSS. Thank you.

Mr. McKittrick?

Mr. MCKITTRICK. Along that same line I would like to point out that the American Institutes of Architects and ASHRAE have initiated a program of formal cooperation in the field of energy standards and development, and that joint liaison committee has been activated and those groups are working together.

We have recently employed a new consulting mechanical engineer for two school projects, and in our initial discussions with him asked him to give us some kind of idea about the size of the total cooling plant for this particular school building, and his estimate was 220 tons of air-conditioning based on the area of the building.

When we provided him with input concerning the building envelope, the values for the wall, the roof, windows, shading on the grass, all of the different things we were aware of that we could do to make that building energy efficient and plugged all of those values into his computer program, he was flabbergasted when the number came out at 150 tons. So what this says is that architects also are in a position to influence the energy conservation in the building.

You can't leave it all to the mechanical engineer. Had he designed that building the way he had been designing them for his previous clients, the air-conditioning load would have come out to about 220 tons. I use that to make the point that in this legislation we as architects feel we are justified in asking to be included in the decision making team.

Mr. CROSS. Fine.

The last thing is we got into discussion earlier about the list of things in the Carter bill. I would appreciate it if all of you, if you can, would provide the subcommittee with written comments on what you would like to see changed, added or deleted to that sort of a list if that were to be included in legislation.

I think that would be most helpful. You are all indicating some problems with that, and I think we need to know what they are and what might be done.

Mr. CROSS. With that, I think the hearings are adjourned subject to the call of the Chair.

Thank you very much.

[Whereupon, at 2:37 p.m. the subcommittee adjourned subject to the call of the Chair.]

[Material submitted for inclusion in the record follows:]

90-490 O - 77 - 14

Office of the President

700 North Rush Street
Chicago, Illinois 60611
(312) 787-0977

STATEMENT ON BEHALF

OF THE

NATIONAL CONGRESS OF PARENTS AND TEACHERS

Before the

Subcommittee on Elementary, Secondary and Vocational

Education

of the

House Committee on Education and Labor

Concerning HR 5996

EMERGENCY ASSISTANCE FOR SCHOOLS ACT

Submitted by: Mrs. Carol Kimmel
President
National Congress of
Parents and Teachers

May 15, 1977

Mr. Chairman and members of the Committee, I am Carol Kimmel, President of the National Congress of Parents and Teachers, a national organization of over 6 million members dedicated to the welfare of children. I am pleased to have this opportunity to express the support of our members for H.R. 5996, and to share with you some of our concerns about the effect of energy costs and shortages on our schools and our children.

During last winter's fuel crisis, schools provided one of the prime paths to public consciousness-raising on energy conservation. Temperatures were lowered drastically in schools, even when shopping centers proceeded with business as usual, parents were reminded to dress children in heavier clothing so that they would be comfortable in cooler classrooms, schools took seriously the need to keep doors and windows closed, to switch off lights and to be sure that areas like hallways were kept at minimum lighting levels, consistent only with safety. The constant dialogue about energy savings between families and schools made parents aware of the need to conserve energy in their own homes. And yet parents still saw considerable interruption of school programs in many parts of the country, and a loss of school days that have been difficult to make up.

We became aware of a challenge to find ways of using less energy and still being able to keep the schools operating so children would not fall behind in their education. The greatest barrier to meeting that challenge is the skyrocketing cost of energy.

The American School Board Journal, in a recent survey, found that school districts at the end of only 7 months of the year, had already exhausted their yearly utilities budget and that even using school conservation measures in which thermostats were lowered to 65 degrees in the daytime and 55 degrees in the evening,

costs rose in some systems more than 150 percent. A study by the American Association of School Administrators indicated that the rise in fuel costs between 1972-73 and 1974-75 alone represented sufficient funds to cover about 43,000 teaching positions.

Parents and taxpayers are feeling the impact of rising fuel costs at a time when inflation is severely straining the ability of local school systems to adequately fund even the normal school budgets. Costs for all education budgets continue to rise, and at the same time, over half the proposed school bond referendums are being defeated. Pressures of rising school energy costs are occurring at the same time taxpayers are attempting to meet these same economic pressures on their family budgets, and school systems are, therefore, unable to make up the differences by voting additional local tax revenues. As a result, parents and school boards have become aware that funds intended for classroom use are diverted, by necessity into energy costs. And there seems to be no end in sight.

Further aggravating the problem is the declining enrollment in many school districts, resulting in less construction of new and more energy-efficient plants. Instead, schools face this energy cost crisis, burdened by older buildings with inefficient heating systems, little or poor insulation, aging and unresponsive temperature controls and a myriad of other problems which are wasting both energy and educational funds.

The answer is not in research - we know what the problem is. The answer is in direct assistance to school districts to enable them to restore energy efficiency in their school buildings and to thereby cope with the continual drain on educational funds now being siphoned off into utility costs. We support H.R. 5996 with the expectation that it will assist school efforts to update older facilities

for greater energy efficiency and more realistic costs, and that it will share, through the demonstration projects, imaginative ways to cope with similar problems.

Two questions are uppermost in the minds of most parents: In the coming years, will schools be able to maintain complete educational programs without the widespread and severe interruptions and school closings which we experienced last winter? Also, can schools reduce the alarming increase in energy costs that are consuming an ever increasing portion of the educational budget? Neither can be answered positively, unless supplementary federal funds are available to help local school systems adapt present and future physical plants for greater energy-and cost-conserving controls.

May we also suggest one area in which some demonstration funds could develop more adequate guidance. It seems clear that more flexible patterns in school scheduling are in order to reflect local climates and energy demands. The present patterns wer born out of a response of school systems to agrarian needs to have children at home to help during the growing season, and reflect times, now past, when energy was abundant. Neither fact is true nation-wide any longer. A conscious effort should be made to feed these altered circumstances into the determination of school scheduling so that we are using school plants during the times which require the least energy resources. Total school time requirements can reflect local climate conditic when the least heating or cooling is required. Some systems have changed their dates of opening and closing, as well as vacation periods, and this should be further encouraged as a responsible use of limited energy resources. Our life styles must adjust to a period of scarcity and high cost rather than abundance and waste. This bill, by emphasis and choice, can help encourage the practical adaptation of new long-term patterns of energy usage, and at the same time, deal with the immediate crisis situation.

Thank you for this opportunity to share our concerns and our suggestions with you.

COUNCIL FOR AMERICAN PRIVATE EDUCATION
1625 EYE STREET, N. W. (SUITE 1010)
WASHINGTON, D. C. 20006
(202) 659-1384

May 9, 1977

Dear Mr. Perkins:

The members of this Council (CAPE) are following with great interest developments in connection with proposed legislation to provide emergency assistance to help educational institutions conserve energy (H.R. 5996). Council members, indicated on this letterhead, serve or operate approximately 14,500 private (nonpublic) schools enrolling about 4.2 million children. Private school plants house over ten percent of the nation's school children and use an estimated ten percent of the energy required nationally by precollegiate educational institutions. We wish to cooperate in efforts to conserve energy and ask to be dealt with as "full partners" in this effort.

We support your intent to focus Congressional attention on the serious problem being faced by all educational institutions as a result of the nation's continuing energy crisis--and we are pleased that Section 1007 of your bill requires that local educational agency applications for "technical assistance" contain provisions "designed to assure that the technical assistance...will be shared with private elementary and secondary schools."

We note, however, that Sections 1002 and 1004 authorizing "Basic Grants" and "Demonstration Projects," respectively, are restricted to public elementary and secondary schools. We believe that these sections should make provision to assist private elementary and secondary schools, and we urge that before the bill is reported to the House the language be modified so that private schools are specifically included under these sections and they may join in this constructive program of energy conservation.

The testimony of representatives of national education constituencies, consistently emphasizes that this legislation is being drafted to meet the overriding national need to conserve energy. The American Council on Education, for example, in their testimony before the Senate Subcommittee on Education on March 11, stated:

> "...education is a significant, and energy-intensive, sector of the American economy which cannot be ignored in developing a sound energy policy. It is estimated that the nonprofit sector accounts for approximately 10 percent of the nation's total energy consumption, and the largest share of this percentage is in education."

Private elementary and secondary schools comprise a significant segment of this nonprofit sector, and the testimony presented at that hearing makes it strikingly clear that the problems being encountered by the private schools parallel those

MEMBERS: THE AMERICAN LUTHERAN CHURCH; AMERICAN MONTESSORI SOCIETY; ASSOCIATION OF MILITARY COLLEGES AND SCHOOLS OF THE U.S.; FRIENDS COUNCIL ON EDUCATION; LUTHERAN CHURCH--MISSOURI SYNOD, BOARD OF PARISH EDUCATION; NATIONAL ASSOCIATION OF EPISCOPAL SCHOOLS; NATIONAL ASSOCIATION OF INDEPENDENT SCHOOLS; NATIONAL CATHOLIC EDUCATIONAL ASSOCIATION; NATIONAL SOCIETY FOR HEBREW DAY SCHOOLS; NATIONAL UNION OF CHRISTIAN SCHOOLS; U.S. CATHOLIC CONFERENCE; NEW MEMBER: NATIONAL ASSOCIATION OF PRIVATE SCHOOLS FOR EXCEPTIONAL CHILDREN

EXECUTIVE DIRECTOR: DR. BOBBY L. LAMBORN

being encountered by the public schools. To exclude them from the incentive Sections of this legislation would significantly weaken conservation efforts of the Congress.

The Carter Administration's energy conservation program provides this type of assistance, as you know, for the private schools. And the Disaster Relief Act of 1974 provides legislative precedent for this type of assistance.

We strongly urge that all segments of the American education community be involved effectively and equitably in any Federal program to conserve energy. We request that this letter be incorporated in the record of your hearings on H.R. 5996.

Respectfully,

Robert L. Lambert
Executive Director

Honorable Carl D. Perkins, Chairman
Subcommittee on Elementary, Secondary,
and Vocational Education
Committee on Education and Labor
House of Representatives
Washington, D.C. 20515

OFFICE OF GOVERNMENT LIAISON

1312 MASSACHUSETTS AVENUE, N. W. • WASHINGTON, D. C. 20005 • 202 659-6606

UNITED STATES CATHOLIC CONFERENCE

May 9, 1977

Honorable Carl Perkins, Chairman
Committee on Education and Labor
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

On behalf of the United States Catholic Conference I am writing to express our views on H.R. 5996. As a member of the Council on American Private Education (CAPE), we fully support the views of the Council which were set forth in their letter to you dated May 9, 1977. We strongly support their recommendation that H.R. 5996, which is now pending before the Subcommittee on Elementary, Secondary and Vocational Education, be amended to include nonpublic elementary and secondary schools in the full benefits of this legislation. Anything you can do to support this position will be greatly appreciated.

We request that this letter be incorporated in the record of the hearings on this bill.

Sincerely,

James L. Robinson
Director

JLR/ecg

NATIONAL SCHOOL BOARDS ASSOCIATION
1055 Thomas Jefferson Street, N.W. • Washington, D.C. 20007
(202) 337-7866

May 17, 1977

Honorable Carl D. Perkins, Chairman
House Subcommittee on Elementary,
Secondary and Vocational Education
B346C Rayburn
Washington, D.C. 20515

Dear Mr. Chairman:

Please find enclosed our statement on H.R. 5996. If we can provide you with any further information, please do not hesitate to contact my office.

Sincerely,

Michael A. Resnick
Director
Legislative Service.

MAR/par

NATIONAL SCHOOL BOARDS ASSOCIATION
1055 Thomas Jefferson Street, N.W. • Washington, D.C. 20007
(202) 337-7666

STATEMENT ON BEHALF OF THE

NATIONAL SCHOOL BOARDS ASSOCIATION

on

H.R. 5996, amending the

ELEMENTARY AND SECONDARY EDUCATION ACT OF 1965

submitted for the record to the

Subcommittee on Elementary, Secondary and Vocational Education

U. S. House of Representatives

May 17, 1977

Introduction

The National School Boards Association is pleased to have this opportunity to submit a statement to the Subcommittee on the subject of energy conservation in the public schools. The National School Boards Association is the only major education organization representing school board members -- who are in some areas called school committees or school trustees. Throughout the nation, approximately 100,000 of these individuals are Association members. These people, in turn, are responsible for the education of more than ninety-five percent of the nation's public school children.

Currently marking its thirty-ninth year of service, NSBA is a federation of state school boards associations, with direct local school board affiliates, consituted to strengthen local lay control of education and to work for the improvement of education. Most of these school board members are elected public officials. Accordingly, they are politically accountable to their constituents for both education policy and fiscal management. As lay unsalaried individuals, school board members are in a rather unique position of being able to judge legislative programs, purely from the standpoint of public education, without consideration to their personal professional interest.

Association policy is determined at the NSBA annual convention at which representatives from across the nation translabe policies and resolutions into ongoing programs.

On behalf of the nation's 16,000 school boards, the National School Boards Association strongly supports H.R. 5996, a bill providing federal assistance to meet the rising energy costs in our nation's public schools. Below are some modifications which we hope the Subcommittee will consider favorably. We are also enclosing a more detailed statement on H.R. 5996 and a copy of our position regarding a national energy policy for schools.

Rising Energy Costs

As our attached position paper outlines, public schools have experienced rapid increases in energy costs without a proportionate ability to raise tax revenues. Consistent with the administration's energy policy, federal energy assistance to schools would have the effect of a continuing property tax "rebate" and would serve as an incentive for communities to make their schools more energy efficient. In addition, as energy costs occupy a larger percentage of school district budgets, educational programs and local employment may suffer. For example, the median school district's budget devoted to energy increased at a 15% rate over the two year period beginning with the 1972-73 school year. Nationally, this increase cost public schools an additional one-half billion dollars.

Summary Recommendations

Turning to the specifics of H. R. 5996, our Association would recommend the following:

- Either some safeguards or a percentage set-aside to ensure that the effects of "grantsmanship" do not unduly disadvantage the large number of small school districts.

- Basic grants authorizations should be $1 billion annually.

- If authorization levels cannot be increased, total authorizations should be available during a three year period (FY 78-80) rather than on an annual basis.

- Technical assistance should be an allowable expenditure under the basic grants section.

- Transfer $110 million of the technical assistance authorizations to basic grants and strike clauses (1) and (2) from section 1007(b).

- Transfer $25 million of the demonstration project authorization to basic grants and use the remaining $5 million for dissemination of promising energy conservation methods.

- Add a section to provide energy conservation assistance for new construction.

- Establish a national goal for school energy conservation, such as 20% increased energy efficiency.

- Add a section devoted to curriculum development and adult education efforts.

NATIONAL SCHOOL BOARDS ASSOCIATION
1055 Thomas Jefferson Street, N.W. • Washington, D.C. 20007
(202) 337-7666

Detailed Recommendations on H.R. 5996

We are pleased to see direct application to the Commissioner for discretionary energy conservation grants. However, we are concerned that many deserving small school districts do not have the experience or staff to compete on an equal basis with larger districts. Accordingly, we seek either some safeguards or a percentage set-aside to ensure that the effects of "grantsmanship" does not unduly disadvantage the large number of smaller school districts.

While it is difficult to estimate the needed amount of authorizations, it is certain that almost all districts could benefit from some federal assistance and could benefit more the sooner such assistance was available. Accordingly, we recommend basic grants authorizations of $1 billion annually. In the event authorizations cannot be increased, it might be more appropriate to make the total authorizations available for a three year period (FY 78-80) rather than providing for annual authorizations. Besides releasing the assistance more rapidly, a triennial authorization would have the advantage that, if the program proves to be highly successful, additional appropriations could be reauthorized before the enabling legislation expired.

With regard to the three types of grants, we anticipate that, of the many school districts which have already recognized their general energy conservation needs, most will have to seek additional detailed technical assistance before embarking upon major rennovation projects. Rather than applying for two grants in two separate years in order to complete one project, we suggest that technical assistance be an allowable activity under the basic grants section. We would not favor elimination of technical assistance , since some districts may only require this type of assistance. However, we recommend that all technical assistance be directly tied to an ongoing or proposed energy conservation project. Accordingly, we recommend striking clauses (1) and (2) of section 1007(b) and transferring $110 million of the authorization into basic grants.

With regard to demonstration grants, it is our understanding that several federal agencies are conducting research and funding demonstration projects in the areas of alternative energy and energy conservation. In order not to further decentralize existing efforts, we recommend that an authorization of $5 million be earmarked for disseminating to educational institutions the latest developments in energy conservation methods and designs. The remaining authorization should be transferred to the basic grants program. This change would allocate funds to the area of most immediate need, and at the same time school districts would still be eligible to apply for demonstration grants from the federal energy agencies.

Given the economic plight of most growing school systems, our Association recommends an additional section in the bill to provide federal energy conservation assistance for new construction. In this manner, communities with increasing enrollments would be given an incentive to bear the higher costs of energy efficient construction. FEA has done research to show the pay-off rates of using known energy conserving designs and construction techniques. Federal matching grants could be provided, for example, to any energy saving construction projects for which the pay-off rate (in comparison to normally employed construction methods) exceeded 5 years. A sliding scale could be used so that a larger federal percentage would be available for the projects having the longer (i.e., slower) pay-off rates. The effect of this sliding scale could be to guarantee a maximum 5 year pay-off period for the added costs of energy conserving construction.

Given the seriousness of the energy shortage, we recommend the statement of purpose establish a national goal for energy conservation in the nation's educational institutions. For instance, a national goal could be to increase energy efficiency by at least 20% in all of our schools by 1980-81 school year. The Association believes that establishing a reasonable goal and comparing it to the project evaluations required under H.R. 5996 would help generate both a sense of common urgency and accomplishment.

Another national goal could be to increase energy conservation awareness among students and adults. Such a goal would require a new section in the bill devoted to curriculum development and adult education efforts. In this manner schools could play an important role in educating the public about insulation methods and energy efficiency in appliances and automobiles. In addition, curriculum development funds could be used to stress career awareness and exploration of emerging energy related fields. Another important area in curriculum development would be to adapt vocational training courses to the latest energy conservation techniques. Without skilled labor trained to implement energy conservation in the industrial, technical, and construction fields, it will be more difficult to achieve our national goal of reducing energy consumption.

90-490 O - 77 - 15

State of Alabama
Department of Education
State Office Building
Montgomery, Alabama 36130

Wayne Teague
State Superintendent of Education

May 16, 1977

Honorable Carl D. Perkins
House of Representatives
Room 2365 - Rayburn Building
Washington, D. C. 20515

Dear Mr. Perkins:

I am enclosing testimony by Dr. Wayne Teague, State Superintendent of Education in Alabama, for H.R. 5996. We are pleased that you have introduced this bill and hope this testimony will be helpful to you and members of your committee.

Sincerely yours,

Bill

W. E. (Billy) Mallown, Jr.
Assistant Director, Division
of Administration & Finance
- Federal Programs -

WEM/hm
Enclosure
cc: Mr. Jack Jennings

UNITED STATES HOUSE OF REPRESENTATIVES

SUB-COMMITTEE ON ELEMENTARY, SECONDARY, AND VOCATIONAL EDUCATION

HONORABLE CARL PERKINS, CHAIRMAN

STATEMENT OF

WAYNE TEAGUE
STATE SUPERINTENDENT OF EDUCATION

ALABAMA STATE DEPARTMENT OF EDUCATION

H. R. 5996

EMERGENCY EDUCATIONAL ASSISTANCE ACT

Mr. Chairman and Members of the House Sub-Committee on Education, I am Dr. Wayne Teague, State Superintendent of Education from the State of Alabama. It is a pleasure and an honor for a Chief State School Officer from the "sunny south" to have the opportunity to present a testimony to this sub-committee on H. R. 5996, The Emergency Educational Assistance Act. Mr. Chairman, this is an important and significant bill that will provide the educational institutions of this Nation with the opportunity to conserve energy, to plan for long-range conservation, and to provide technical assistance to educational institutions. We appreciate the leadership that members of this sub-committee have provided in presenting this bill to the Congress for consideration. We realize that energy conservation can lead to significant decreases in fuel consumption.

As you know, the jet stream was confused and dumped frigid masses of arctic air into the southern states earlier this year. For several days the thermometer hovered slightly above zero and the temperature in Montgomery, the heart of Dixie, was lower than it was in Nome, Alaska. Most of our schools are not designed for this kind of weather. As a result, schools closed all over the State. We have lost more school days because of severe weather and illness resulting from such weather than I can remember. If predictions of climatologists are right, the world may be headed for even more severe cold weather in years to come.

I am presenting information on a survey showing the number of days schools in Alabama were closed because of inclement weather and because of a shortage of fuel.

Average Number of Days Missed in Alabama Schools Because of Weather and Fuel Shortage School Year 1976-77

Avg. Days Missed Weather	Avg. Days Missed Fuel	Total Avg. Days Missed
2.9	2.25	5.17

The summary shown below is of a building survey taken in Alabama in June, 1976. Mr. Chairman, I believe I am safe in saying that very few of these buildings have any energy saving devices such as insulation, weather stripping, or storm windows.

Years of Construction - Alabama Schools*

Year	Number Erected	Percent of Total
Prior to 1932	497	9.2%
1932 - 1945	654	12.2%
1946 - 1960	1,705	31.8%
After 1960	2,496	46.6%
Total	5,352	

*Based on a Survey by the Alabama Department of Education June, 1976

From these figures you can appreciate our problem in Alabama. More than half of our school buildings were constructed at least 16 years ago. Many of them are 20, 30 and even 40 years old. They are not equipped with modern fuel-saving facilities or the kind of insulation needed to protect school children and their teachers from extremely cold weather.

Alabama School officials have another problem which involves the climate in the deep south. Many times we experience torrid

temperatures reaching into the 90's and in some cases above the 100 degree mark during the Spring, Summer, and early Fall. Classrooms should be air-conditioned in order to utilize them to the best advantage for instructional purposes. We could move toward more efficient year-around educational programs if school plants were air-conditioned. Based on cost estimates provided by the Tennessee Valley Authority, it would be possible to provide adequate air-conditioning for the average public school in our state at a cost of approximately 1.7 cents per square foot per month, or based upon possible useage for four months per school, it would cost $48.96 for a 24 ft. x 30 ft. classroom.

Mr. Chairman, the problem in Alabama is that school administrators are not aware of the energy crisis which creates an inability to plan and afford proper energy conservation techniques. The problem in Alabama, as in many states, is that the citizens have become increasingly aware of the tax burden necessary to meet the rising costs of energy and in many instances are reluctant to pass tax measures.

We have been informed by a recent publication of the Tennessee Valley Authority (TVA) that a completely uninsulated frame building, with no storm windows or storm doors, 15 percent of the outside wall area made-up of windows and doors, and an infiltration rate of one air-change each hour - suffers heat lost through the various portions of the building as is indicated:

	Heat Loss
Ceiling area	45%
Floor area	20%
Windows and doors	12%
Outside walls	12%
Infiltration	11%
TOTAL	100%

The majority of our school buildings were built when energy was relatively inexpensive. There were few incentives to encourage the conservation of energy. Consequently, most schools do not have adequate insulation. More can easily be added. If there is some ceiling insulation, adding more to bring it to recommended levels will increase comfort, save money, and save energy. This could be accomplished to a greater degree than when insulation is installed where there was none before.

Even without the ever increasing demand for fuel which this winter's cold spells have produced, there is more money spent on fuel than ever before. We note, Mr. Chairman, that our energy cost in Alabama rose 56 percent. When we consider that 10 percent of the energy used in this Nation was used by the educational community, we are quite aware of the need for education energy conservation measures.

The Appalachia area, comprising thirteen states, has vast deposits of fossil fuels, especially coal. Production from these reserves has played an important role in Regional and the National history. But during the 1950's and 1960's, numerous technological changes and new energy sources caused the Regional extractive industries, especially coal mines, to reduce output sharply. By

1971, Appalachian fuels -- coal, oil, natural gas and hydro-power -- furnished only 16 percent of the nation's domestic energy supply. The impact of this decline was most severe in the Central Appalachian coal fields, where there were no alternative industries to take up the employment slack and provide some measure of economic stability. The harsh result was a sharp increase in unemployment and massive out-migration of workers and their families in search of jobs elsewhere.

This problem is not unique to Alabama. I feel that the problem presented here for Alabama would be fairly common throughout the Southeastern United States. We will need expert guidance in using less energy. We must accept this mandate and prepare now to conserve energy, to find new sources of energy, and to provide technical assistance to schools in energy conservation matters. James Schlesinger, the White House Energy adviser, noted recently that our nation's supplies of natural gas have been dropping about 4 percent each year. While we are fortunate in Alabama to possess enormous deposits of coal as well as producing oil and gas fields in our State, this has not helped lower the cost of such fuels to our schools. We know that the days of cheap, abundant energy are past. Energy conservation is vital in the immediate future. Presently, we must protect the quality of our environment -- air, land and water -- as we move to meet our increase in energy needs.

Mr. Chairman, we are aware that there are many energy conservation measures that may be implemented, but these measures are costly. A few examples of these energy conservation measures that

can be applied to schools are pointed out to us in a recent TVA publication. Schools could convert to fluorescent lighting fixtures and provide lighter colored finishes on walls, cabinets, and counter tops for greater light reflection, as well as install insulated draperies to help reduce heat gain or loss. Thermostatically controlled attic ventilators will also help reduce high temperatures during the warm summer months. Weather stripping around the doors and windows will improve the heating efficiency of most buildings.

Many of our schools have stretched their budgets to the breaking point in an effort to take care of substantial increases in their utility bills.

The following is a listing of the gas and electric bills for Montgomery County Schools during a five-month period -- September through January for 1974-75, 1975-76 and 1976-77:

	1974-75	1975-76	1976-77
September	$23,730.19	$33,188.01	$42,546.76
October	32,514.68	39,128.15	49,095.49
November	40,717.74	41,083.37	62,973.16
December	45,970.39	55,367.60	77,264.87
January	56,409.16	68,685.11	85,719.15
TOTALS	$199,342.16	$237,452.24	$317,599.43

The totals for these five months,

for 1974-75 are ---------- $199,342.16
for 1975-76 are ---------- 237,452.24
for 1976-77 are ---------- 317,599.43

This represents an increase of $38,110.08 for the 5-month period from 1974-75 to 1975-76. With this amount they could have employed 8 teachers in the school district for a 5-month period. There has been an increase of $80,147.19 over a five-month period from 1975-76 to 1976-77 -- an amount with which they could have employed 20 teachers for a 5-month period.

School officials are doing what they can to conserve fuels used for heating buildings. Oxford High School in northeast Alabama achieved a savings in fuel costs estimated at 14 percent by strict control of thermostats. Design temperatures were reduced from 75 degrees in occupied areas to 65 degrees with a cutback to 55 degrees in unoccupied areas. A savings in excess of 50 percent has been realized over a heating system with no controls at all. It is my understanding that a number of our colleges and universities have realized savings in utility costs through lowering thermostats and diligent efforts to turn off unneeded lights.

We realize that many of our school plants are energy wasteful and that they are not equipped to take advantage of more efficient operating techniques now available. Funding provided by House of Representative Bill 5996 would be most helpful to our public schools in conserving heating fuels.

We are most appreciative of the opportunity to provide this testimony on a bill we consider to be of vital importance to schools of our Nation. We wholeheartedly support the bill and wish to urge the members of this committee and members of Congress to support this bill. May I respectfully point out, however, that matching requirements recommended by this bill may lessen the intent of the legislation. The schools of our Nation are faced with critical financial demands and I feel that the "matching funds" definition of this bill may simply mean that the, "rich will get richer and the poor will get poorer." I would like to ask the members of this sub-committee to give the "matching funds" definitions of this bill additional thought.

I commend you, Sir, on the Technical Assistance portion of the Act. This provision will greatly enhance the effectiveness of the program and will help the State Educational Agencies to provide more adequately for usage of fuels.

We would prefer to see additional funds being made available to additional local education agencies as opposed to the demonstration projects portion of the Bill. It is our belief, at this point, that these funds might be utilized more effectively in implementing Local Education Agency programs.

In closing, Mr. Chairman, we commend you for your foresight in presenting this outstanding measure to this sub-committee. We feel that this Bill, which is designed to help schools, colleges and universities across the nation deal effectively with the increasing cost of energy, will greatly enhance our school programs.

THE COALITION OF INDEPENDENT COLLEGE AND UNIVERSITY STUDENTS, WASHINGTON, D.C.

Statement of the Coalition of Independent College and University Students on H.R. 5996 before the House Elementary, Secondary and Vocational Education Subcommittee, MAY 3, 1977.

Mr. Chairman and Members of the Subcommittee, I am Lawrence S. Zaglaniczny, National Director of the Coalition of Independent College and University Students. We thank the Subcommittee for the opportunity to present our views on H.R. 5996 and ask that this statement be included in the record of these hearings.

The intent of this legislation is admirable in its emphasis on energy conservation efforts. H.R. 5996 is in the spirit of President Carter's call for the nation's assistance in meeting our crisis in energy. The education plant in this country could make a substantial savings in energy and cost if it were more energy efficient. However, the Bill is not complete for it does not include colleges and universities in its aid We most strongly urge H.R. 5996 be amended to include the postsecondary sector.

The Coalition is a student lobby and research group representing the views of students who attend independent colleges and universities. Although our organization's interests are primarily centered on seeking a more balanced and richer Federal system of student financial aid, this Bill is of interest to students in the private higher education sector. H.R. 5996, if amended, would not directly aid students—so why are we supporting this legislation, hope to see it amended and enacted into law?

Very simply, the intent of this Bill is to promote energy conservation measures through direct grants, demonstration projects and technical assistance. This goal is admirable on its merits alone. Higher education institutions should be included in this Bill, because of their year-round operations and large physical plants. Postsecondary institutions can make a large contribution to saving energy, or at least, to not wasting our resources. If included, we believe the incentives provided in this legislation will spur institutions to assist President Carter in his national energy plan. In any event, many colleges have instituted energy savings measures on their own initiative. This legislation should be amended to assist in the further expansion of conservation plans. H.R. 5996 is for institutions, however, it also would be for students albeit indirectly.

The most flexible source of revenue for private colleges and universities is tuition. If energy costs to institutions rise because of unusual weather conditions, inflation, decontrol, international price increases or boycotts, then institutions to meet the increased fuel bill can only look to raising these monies from a limited number of sources. The most likely candidate for generating such funds is from tuition increases.

If an amended and enacted H.R. 5996 were to be implemented and widely utilized by colleges and universityies, then one would expect tuition not to always jump to a level equal to the rise of fuel costs. Through conservation savings the rate of increase in tuition costs may be expected to be moderated as compared to those schools that do not practice the conservation strategies that this Bill would encourage. So, as students, especially coming from independent institutions, we do have a stake in an amended Bill. Such legislation will not prevent energy related tuition increases, but it will moderate those increases for those colleges that take advantage of the program.

In conclusion, we urge the inclusion of colleges and universities in the program proposed in H.R. 5996. Such legislation will foster conservation efforts already underway. It will provide incentives for institutions to develop energy conservation policies and practices. For students, particularly for those who attend independent colleges that take advantage of the program, they will be assured that the tuition dollars they pay will be moderated in the rate of its increase and not wastefully go up the chimney, out the door or through leaks in windows.

The Coalition of Independent College and University Students supports an amended version of H.R. 5996 including colleges and universities. We urge quick consideration and implementation of such legislation before next winter.

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NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

"Putting It All Together For The Engineer"

Address Reply To:
LEGISLATIVE AND GOVERNMENT AFFAIRS
OFFICE OF THE CHAIRMAN

May 23, 1977

The Honorable Carl D. Perkins
Chairman
Committee on Education and Labor
U.S. House of Representatives
B 346C Rayburn House Office Building
Washington, D.C. 20515

Dear Congressman Perkins:

I have enclosed a letter from H. Harry Phipps, P.E., a member of the National Society of Professional Engineers who testified before the Subcommittee on Elementary, Secondary and Vocational Education on May 3, 1977 on the topic of H.R.5996. You will remember that you requested that Mr. Phipps comment on the Administration's energy proposals and forward his comments to the Committee. In his letter to you Mr. Phipps discusses various sections of the plan and offers suggestions for its improvement.

We hope you find this information useful. If the Society can be of further assistance, please let us know.

Sincerely yours,

James C. Hughes
Director of Legislative and
Government Affairs

Enclosure

JCH/mod

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CHLORIDE

May 20, 1977

The Honorable Carl D. Perkins
House of Representatives
Room 2365
Rayburn House Office Building
Washington, D.C. 20515

Dear Congressman Perkins:

At the May 3, 1977 meeting of the Subcommittee on Elementary, Secondary and Vocational Education relating to testimony on H.R. 5996, you requested those of us serving as witnesses to provide comment on the Administration's proposed legislation on the same subject. Following are my comments on the above-mentioned legislation.

In general, H.R. 5996 is much more effectively written and will be easier to understand and apply than the copy provided me of Part C "Energy Conservation Program for Schools and Hospitals" as proposed by the Administration. This, I believe, will be obvious to anyone who reads the two proposed bills, and it would appear unnecessary for me to comment further at this point.

I have some specific comments in regard to Section 391, (1) and (2). I suggest the definition of "building" and "energy conservation measure" might best be left to engineers and others more conversant with such matters. I seriously doubt that you want the word "building" defined simply as a structure that includes a heating or cooling system, or both.

I am particularly concerned that the definition for the term "energy conservation measure" consists of a simple laundry list of things. It completely fails to include the greater number of truly effective energy conservation measures and at the same time, is so long as to almost imply that this list is all of the items that qualify. I submit for your consideration instead some phrasing from the proposed American Society of Heating, Refrigerating and Air Conditioning Engineers Standard 100.4 "Energy Conservation in Existing Industrial Buildings". Using this as a guideline, I submit the following:

(2) The term "energy conservation measure shall include, but not be limited to, such things as measures directed toward (A) increasing the efficiency of the energy using systems and components, (B) upgrading the thermal performance of the building envelope and (C) providing maintenance and operating procedures, recommendations, and guidelines that will attain energy savings.

It will include the modification, alteration, operation and maintenance of existing buildings and complexes for the effective use of energy. Specifically covered,but not limited to, are building exterior envelopes, HVAC systems and equipment, service water heating, electrical servi :e, illumination systems and operational and maintenance procedures.

Incidentally, ASHRAE is in the process of developing Standard 100.5 which applies to institutional buildings and will cover both schools and hospitals. I highly recommend that your Committee consider referencing this Standard in the legislation you develop.

In SEction 391 (8), I would suggest the addition of the word "evaluation" in the second line, so that the line would read ". . .to costs incurred in the evaluation, design, acquisition, . . .". The need for thorough study is well recognized in H.R. 5996 and should be emphasized here also.

As I stated at the hearing, I am concerned that this proliferation of legislation and allocation of funds pertaining to energy conservation may not be properly coordinated between the various State and Federal agencies and programs. This coordination in itself will be a monumental but necessary task, however, to prevent duplication of effort and consequent costs. Perhaps Section 306 (B) is the appropriate place to insert a requirement that all applications be coordinated with the activities in other agencies in order to prevent duplication of effort and to augment the work of others.

I appreciated the opportunity to appear before your committee and to submit these comments on this matter. If I can assist you in these efforts in any other way, please let me know.

Sincerely,

H. Harry Phipps

H. Harry Phipps, P.E.
Energy Manager

HHP:gg/194